FOOD INDUSTRIES

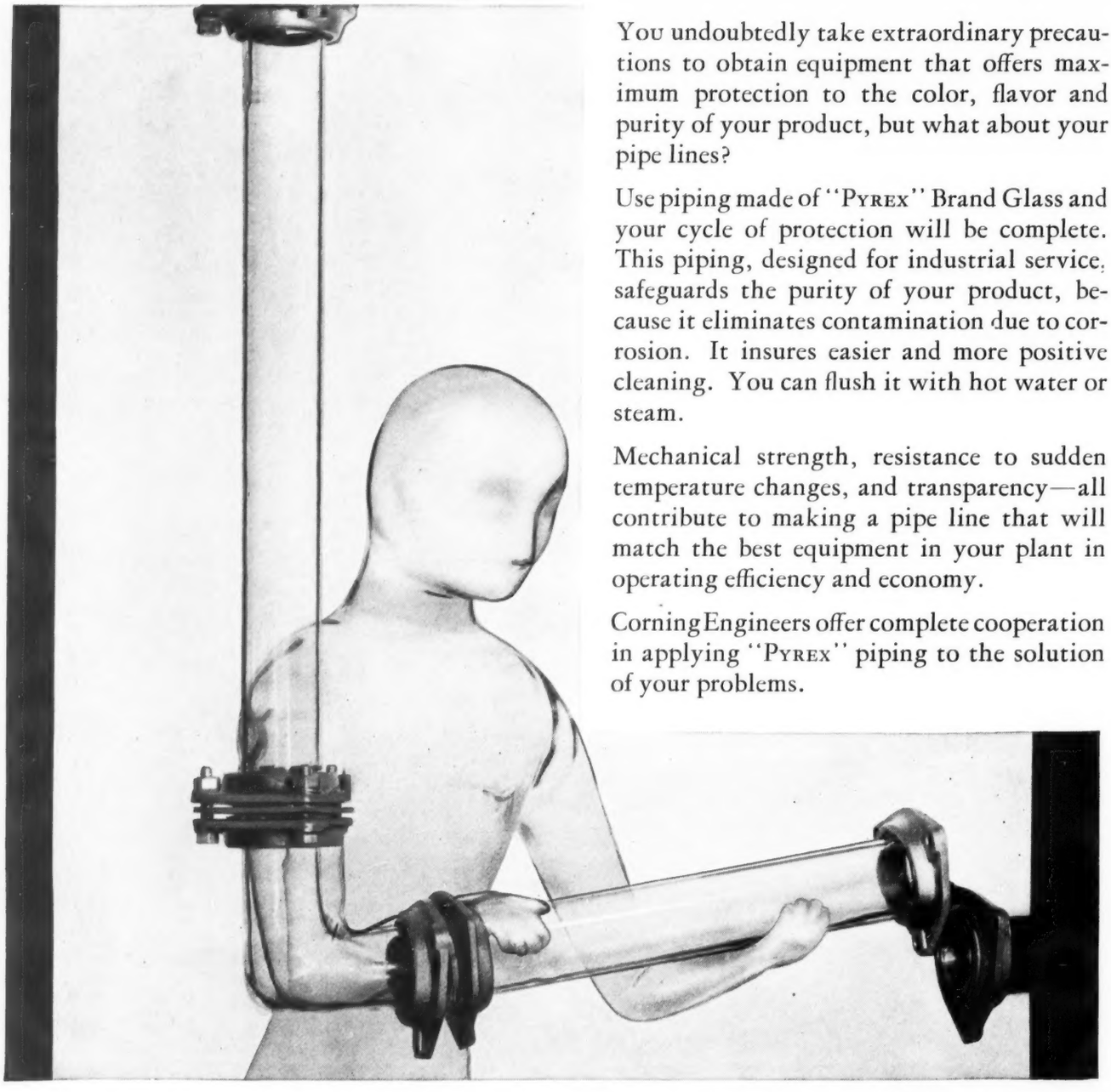
DECEMBER 1938

HOMES OF FAMOUS FOODS . . . CROSSE & BLACKWELL PRODUCTS

IN THIS ISSUE: Complete Air Conditioning; Quick Freezing Methods

McGRAW-HILL PUBLISHING COMPANY, INC.

THE *Connecting link* OF PROTECTION



You undoubtedly take extraordinary precautions to obtain equipment that offers maximum protection to the color, flavor and purity of your product, but what about your pipe lines?

Use piping made of "PYREX" Brand Glass and your cycle of protection will be complete. This piping, designed for industrial service, safeguards the purity of your product, because it eliminates contamination due to corrosion. It insures easier and more positive cleaning. You can flush it with hot water or steam.

Mechanical strength, resistance to sudden temperature changes, and transparency—all contribute to making a pipe line that will match the best equipment in your plant in operating efficiency and economy.

Corning Engineers offer complete cooperation in applying "PYREX" piping to the solution of your problems.

PYREX

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CORNING GLASS WORKS

CORNING N. Y.

"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works

GLASS REVEALS BOTH ITS MAKE-UP AND ITS CONTENTS

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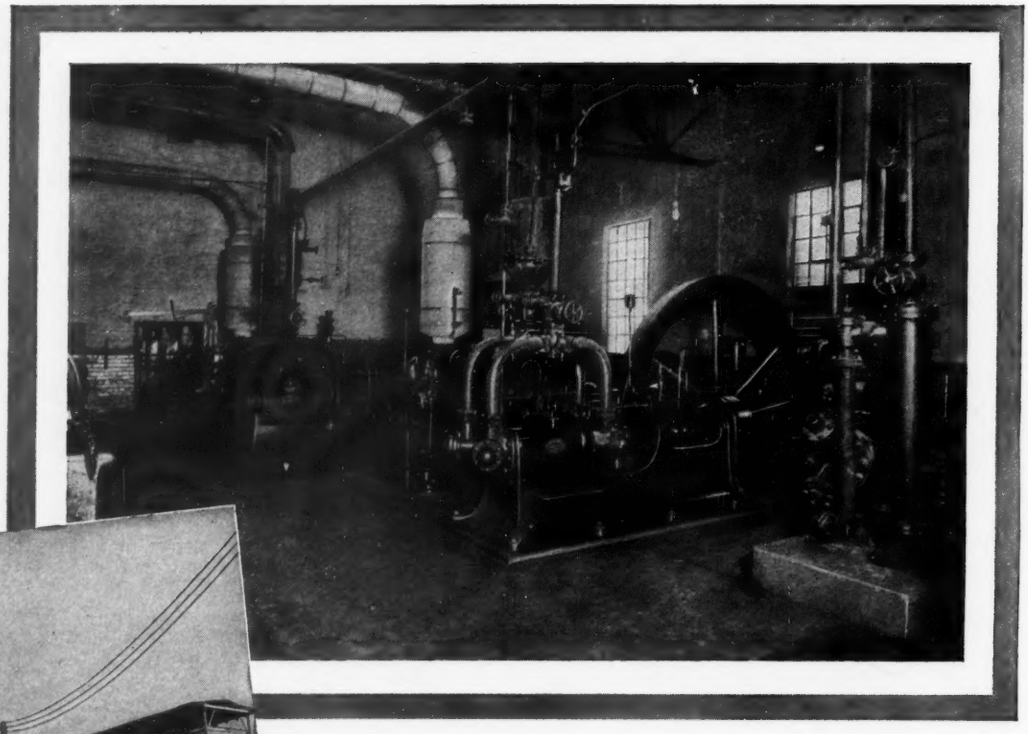
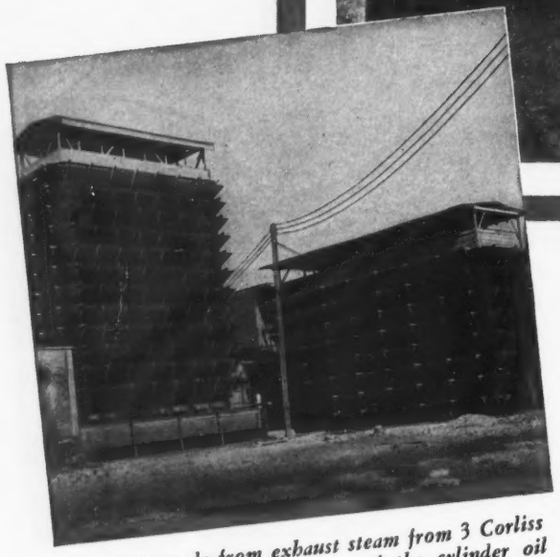
LARGE ICE COMPANY

Simplifies Operation



In plant of Three Counties Ice Co., Wichita Falls, Texas, ammonia compressors are lubricated exclusively with Texaco Capella Oil.



As ice is made from exhaust steam from 3 Corliss engines, thorough separation of the cylinder oil is imperative. For 13 years, Texaco Vanguard Cylinder Oils have been used exclusively.

SINCE 1925, the Three Counties Ice Co., Wichita Falls, Texas, has used but one brand of lubricants.

Whether their interest was cylinder oils for their Corliss engines, or lubricants for their compressors, they have depended upon Texaco.

This policy of concentrating upon one brand has worked out very well. Plant personnel know each Texaco Lubricant they use, what it is used for, how it performs.

Writing of their success with Texaco Lubricants, Chief Engineer G. F. Collins says—"We do not hesitate to recommend to operators of ice plants that they use Texaco lubrication *throughout the entire plant!*"

For better lubrication in *your* plant, get in touch with the nearest of 2186 Texaco warehouses. Texaco lubrication engineers are always glad to help select and apply Texaco Refrigeration Lubricants.

The Texas Company, 135 East 42nd St., New York City.

TEXACO

Texaco Dealers invite you to tune in The Texaco Star Theatre—a full hour of all-star entertainment — Every Wednesday Night — Columbia Network — 9:00 E.S.T., 8:00 C.S.T., 7:00 M.S.T., 6:00 P.S.T.

TEXACO *Capella Oils*

FOR USE WITH ALL TYPES OF REFRIGERANTS

FOOD INDUSTRIES

DISTRIBUTION • PROCESSING

Established 1928—McGraw-Hill Publishing Company, Inc.

Vol. 10, No. 12

Laurence V. Burton, Editor

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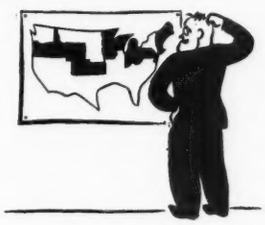
DECEMBER 1938

The Talk of the Industry

» According to the daily papers, on Nov. 8 several more states joined Maine and Vermont in seceding from the Union.



» SOCIAL SECURITY TAXES in 1939 on all manufacturing industry will be about $400,000,000 figured at 5 per cent of the payroll. Add this to about $100,000,000 for higher corporate income taxes, and then add the higher wages that now must be paid and the total is one billion dollars. This represents the added burden on industry over former costs of doing an equivalent volume of business. As one economist puts it, part of this burden is passed on to the consumer, but the profit margin is about a fifth less than it would have been heretofore. As a business man puts it, "We now have to make $2 where we used to make $1—one for the government to get one for the stockholders."

» QUESTION OF THE MONTH: Can employers cut wages and use the saving to pay overtime, giving employees the same pay for the same time?

Answer (by Wage-Hour Administrator Andrews): "There would be no point to the law if employers could do that."

» SURPRISINGLY FEW COMPLAINTS from food manufacturers have arisen as a result of the Wages and Hours Law. Among larger concerns, it appears that janitors are the principal problem. Among very small companies in small communities, places employing from 5 to 25 persons, there appear to be some serious complaints, especially in the carbonated beverage group where there is a definite ceiling on prices obtainable.

A long-range view is needed, however, for the initial application of the law is not all that is to be reckoned with. In the course of time wages are to be upped some more and hours still further shortened. If any incentive to sound engineering of production and production-planning were ever needed, the Wage-Hour Law has provided it.

"Liberals" declare the purpose of the new law is to put more people to work, but management wonders how to comply where it is impractical to hire extras for an hour or two per day.

» WHEN THE GUIDING GENIUSES of the New York World's Fair did their planning they incorporated a very slick stunt well calculated to impress the visiting firemen—at least those who are entertained in the big Board Room in the Empire State Building. At each place is a big blotter bearing the name of the correct occupant of that seat. The one at which we sat belonged to Mr. A. E. Smith—"Al" to you.

» THAT LITTLE HALLOWE'EN PARTY of Columbia Broadcasting Co. on Oct. 30—the drama of the War of the Worlds—brings into focus the magnitude of the problem of sales promotion of coffee. Before the stunt that upset so much of the population we would have bet dollars to doughnuts that practically every radio set in the land was listening to Charlie McCarthy. Evidently quite a number of addicts to Charlie yet remain to be made.

Problems: (*a*) How much coffee do goofy people buy? (*b*) How much

per pound will they pay? (*c*) Do they constitute a market?

» WE HAVE JUST LEARNED, in the wholesale grocery trade, that a supersalesman is a man from the home office with a lower price.

» BUSINESS IS BETTER—much better. A 2,200-mile jaunt around the country interviewing all sorts of food manufacturers has revealed a very decided change for the better in nearly all lines. Manufacturers of the astute and courageous type increased their prices in early autumn after many months of swapping dollars, or red ink. Others have followed their lead. The improved price situation has held. It looks like a fairly satisfactory fourth-quarter for 1938.

One firm that has been in a receivership for more than five years expects to be clear of that problem by next March.

The 1939 outlook for the food business is pretty much a reversal of the outlook a year ago. Except for a few sour spots the prospects of a profitable year are excellent.

A word of caution is, however, desirable. This is a period of acceleration. The Administration is engaged in experiments to control the activity of business through monetary policy. A year and a half ago the Administration believed things were going ahead too fast. Brakes were applied so vigorously and for so long a time that the business vehicle nearly stalled. Then came the reversal of monetary policy. Efforts to accelerate business have been in effect for many months. It is likely that the government will not have learned when to stop accelerating until it has had many more years of experience. Which is likely to result in a swoop upward until it is apparent that the brakes are needed.

Hence the word of caution. Make the most of the next six to nine months. Be ready for good business. Don't be caught napping. It is well to remember that we are a nation which is experimenting with a managed economy. To wait for a year to see if recovery is real or a flash in the pan is, perhaps, to sacrifice the opportunity of the day.

New Tricks to Be Learned

MANAGEMENT MUST LEARN some new tricks under a managed economy. The most important one is to read the signs of the times correctly as they indicate an accelerating or retarding monetary policy. The next one is to gage their effect on business. And next the problem is to have business plans ready to put into execution at the right time, the right time being when prices are low and business is dull. Too often plans will be made, forward commitments will be made, and obligations will be incurred when business is good and prices are high. Proper timing will be all important.

According to the present outlook, success in the next ten years will come to those who master the foregoing principles and have the nerve to act at the right time.

Advertising and Monopoly

DR. THURMAN W. ARNOLD, assistant Attorney-General, made a widely discussed comment about advertising before the elections. In case you missed it, let it be recalled that he seems to believe that a big company, food or otherwise, must not be permitted to advertise its wares in a manner or scale that others cannot afford. For, by such advertising, monopolistic trends are fostered.

While, on their face, his official views do constitute a potential technical threat to food company advertising, the nation learned on Nov. 8, 1938, that even an appropriation for sales promotion running into several billion dollars can fail to convince the masses who are allegedly unable to think, and therefore presumably need protection from their disability.

British-American Trade Pact

AT LAST the long expected reciprocal trade pact has been signed. It is so voluminous that any interested parties must procure the full document—about 600 typewritten pages—for their guidance. Highlights are the few British concessions on food products and raw materials. Wheat goes free of duty while minor reductions are made for oatmeal, certain dried fruits, ripe olives, maraschino cherries, fruit salad, canned grapefruit, loganberries and pineapple. Duties on raw apples and pears are reduced. But no reduction on canned peaches! Grapefruit juice and orange juice go free. Oysters and salmon also are benefited. Lard goes duty free.

Concessions by the United States cover flavoring extracts, candy, smoked and pickled herring, oatmeal, barley flour, biscuits, frozen berries, malt vinegar, jellies, jams and marmalade (35 to 20 per cent *ad. val.*), lime juice, mustard and mustard seed, ginger ale, carbonated beverages, and curry powder.

The real problems appear to lie outside the food industry, but it is hoped by all that the trade agreement will result in increased business all around.

Interesting Labor Views

THE FOLLOWING PARAGRAPHS have been quoted from "Report of Special Committee to Study Labor's Attitude and also Laws Affecting Market-

Hors d'Oeuvres

• The war-like moods which have been sweeping the world can be cured with the proper diet, believes Lewis W. Waters, research vice-president of General Foods Corp. Proper diet promotes friendliness, cheerfulness and neighborliness, he says. In recent years, the world apparently has been drinking its dinner.

• *The amount of labor required to produce a 100-lb. bag of beet sugar has been cut in half in the last 20 years, reports WPA. And the amount of labor required to put a lump of sugar in your coffee has been cut to one tenth, thanks to the tear-open tab on the wrapper.*

• It was suggested at a prune breakfast given recently by California Chiropractors Association that the prune be renamed "Petite Pomme Noir d'Amour," or "Little Black Apple of Love." Since when were wrinkles symbolic of love? Oh, an old love.

• *Here's the happy thought of the month for the cereal manufacturers. It is the theory of Dr. P. H. Belding, editor of "Dental Items of Interest," that tooth decay is caused by a degraded carbohydrate fraction in cereals, principally in corn, wheat and oats. This fraction is believed by Dr. Belding to ferment in the saliva and attack the tooth enamel.*

• Elmer Wheeler, purveyor of tested selling ideas, says, "don't sell the steak, sell the sizzle." And a restaurant on Eighth Ave. goes Elmer one better and serves "tantalizing hip steak," thereby putting sex appeal into a piece of meat.

• *"You should have a few mystery stories in your magazine," suggests one of our helpful readers. Ah, but we have. All the time we carry stories in which the mysteries of successful food plant operation are solved.*

• A can opener will be found in 6939 when archaeologists unearth the Time Capsule buried at the site of New York World's Fair 1939. Westinghouse should have put alongside the can opener a sample of the pipe wrench used by housewives' husbands to unscrew the caps on jars of food.

• *The proposed processing taxes on wheat and cotton have been called by Millers' National Federation "bread and britches" taxes. Which is getting down to the seat of the situation.*

• J. P. Spang, Jr., resigned recently as vice-president of Swift & Co. to become executive vice-president of Gillette Safety Razor Co. He ought to do all right in his new job, having learned all about dehairing in the hog business. —F.K.L.

ing Systems," submitted to the executive board, Florida Federation of Labor. They represent some very interesting views on chain store legislation.

"Learn whether idle wealth is carrying a tax burden equal, dollar for dollar, of income, to that borne by working people."

"Demand that tax laws passed as emergency measures be worded so the proceeds can be used only for purposes intended."

"Emergency needs of the past nine years have created a tax load now equal to more than one-fifth of the average annual income per family."

"We find an alarming disposition reflected in these plans to ignore the ability of the ultimate consumer to pay additional burdens from present or probable future earnings. There is a unanimous willingness to solve all tax problems by taxing someone else."

"While we do not share in political alarm over the mounting total of public debt, we do feel concerned over the fact that the cost of carrying this debt is apparently going to require nearly two billion dollars of federal, state and local revenues each year for the next few years. The interest will be paid to holders of tax exempt securities."

"The nation spends more on taxes than the $11,500,000,000 it spends for food; or the $10,000,000,000 for rent, of the $6,000,000,000 for clothing."

"We believe the Patman bill and state and local punitive tax or control bills directed against chain stores should be opposed by labor."

"We believe the larger opportunity for orderly organization of union members lies in the field of corporate or cooperative store management."

"No one today can honestly question the long run benefits to the user and the ultimate increase in employment created by these 'destroyers of business and wreckers of jobs' (chain stores)."

Where Proper Machine Maintenance Is Decidedly Needed

RECENT DISCOVERIES about the stressed condition of the glass on the interior of hollow glassware has led to the further discovery that many failures of glassware are due to minute scratches inside the containers. If the interior surface is under tension, a small scratch can start the failure—often with expensive results.

Most important of the possible causes of interior scratches are defective brushes or improperly maintained brushes on mechanical washers. Bent metal or wire stems of the brushes, worn out bearings that permit brushes to wobble and bring the hard metal in contact with the glass, or both (usually a combination of both), create a condition that surely will result in interior scratches.

All users of glass containers that require washing will find it decidedly to their advantage to institute a regular and systematic maintenance schedule on their mechanical washers. In the light of present knowledge, there is no condition of the brushing operation, short of perfect, that is good enough. Rubber stemmed brushes may be the answer, but one container failure may cost as much as a brand new washer.

Those who are in the know will be able to read into the foregoing a great deal that is left unwritten.

Status Quo for Milk Bottles

THE UNITED STATES Public Health Service has been interesting itself in the question of the paper milk bottle. The Service has now "decided to survey the problem" at the next meeting of its Milk Sanitation Advisory Board. Meantime the Service is advising milk health authorities that "each city will be justified in maintaining its *status quo* relative to the approval or disapproval of the use of paper milk bottles."

Not all the problems of paper containers for milk and other milk products have been solved. And it is right that the public health authorities interest themselves in such questions. But it will be very wrong if the surveys which are made are not prompt and cooperative.

We hold no brief for any kind of container as against any other kind of food container. But progress in more economical, effective packaging of foods is slow at best. Action is needed promptly, so that every advance will be applied as soon as it has proven itself. May the Advisory Board working with P.H.S. take such stand.

When is a Juice a Beverage?

CANNERS OR BOTTLERS of pineapple and tomato juice are manufacturers of beverages according to some states and not according to others.

Both of these juices are interpreted as beverages in Connecticut, Maine, New Hampshire, Pennsylvania and Rhode Island and are subject to the beverage laws of those states. However, Delaware, Louisiana, Massachusetts, North Carolina, Oregon and Wisconsin state that these two juices are not beverages. You cannot find these interpretations in either the laws or the regulations. You only learn of them after consulting the enforcing officers. But read on.

There is much more to these perplexities. In Michigan pineapple juice is a beverage, but tomato juice is not. In Maryland, it is still different, for here grape juice, pineapple juice and orange juice are beverages if they are in glass bottles, but not if they are in tin cans; while tomato and prune juices are never beverages.

In Nebraska a pure juice is not a beverage, but if anything such as sugar or water is added it becomes a beverage and requires a beverage license for its manufacture.

All of the foregoing oddities or perplexities have been discovered in our efforts to digest and tabulate more important state regulations pertaining to foods. The laws are clear and so are the regulations (sometimes), but there now appears to be need of a secondary series of rulings such as these that can be described as interpretations.

It is to be hoped that a greater uniformity of laws, regulations and interpretations will be forthcoming when the various legislatures get down to overhauling their own statutes. Common sense demands it.

What To Do with A Young Food Technologist

IN A COMPARATIVELY SHORT TIME a considerably larger number of trained food technologists will begin to appear on the scene. They will be seeking jobs in all kinds of food plants. And many a manager is going to scratch his head and wonder what on earth to do with a food technologist even if he were willing to work for nothing.

The answer is simple.

Put the new food technologist to work on any sort of job in the plant where somewhat more intelligence is needed than is possessed by a man with only a strong back. The food technologist has been trained in fundamentals, but he does not yet know your business. He expects to start at ordinary jobs, and make good every step of the way.

When a food technologist or food engineer comes to you for a job, don't turn him down on the mistaken basis that your company has no such job open. Instead, put him to work at any job that is open and expect that he will develop faster and become a much more useful employee than run-of-mine applicants for jobs.

When Is It Best To BARTER?

Latest Revenue Act Affords Tax Savings on Trade-Ins of Equipment

By JOHN THIES
Accounting Service Department, Manager, Quality Bakers of America, New York, N. Y.

DEVELOPMENT OF RECORDS pertaining to depreciable property in the food industries has shown definite progress since 1934, when the Treasury Department Internal Revenue Service issued its now well-known Decision No. 4422. This decision required the taxpayer to support with complete information any depreciation taken. Thus, with the use of property ledger sheets or cards, a much more accurate record could be secured on the individual items of buildings and equipment which make up the plant.

Unfortunately, however, the best of engineers and accountants cannot estimate accurately the expected life of modern equipment, particularly so with the technological improvements now taking place. This causes the important factor of obsolescence to distort all estimates of anticipated life.

For a long time the Treasury Department has undoubtedly recognized the injustice of limiting capital losses to $2,000 on depreciable assets. Many methods to overcome this injustice were under consideration when the Revenue Act of 1938 was being drafted. The final result is, as might be expected, not satisfactory to everyone, but it is a trend in the proper direction and certainly simplifies the financial aspect when the acquisition of equipment replacements is being considered.

MUCH HAS BEEN WRITTEN recently relative to the methods to be considered for transactions relating to the purchase and sale of equipment under the Revenue Act of 1938. Anyone who has ever had an old car to turn in on the purchase of a new automobile and has proceeded to shop around, has quickly discovered that almost every dealer placed a different value on the old car. The answer to this situation is to be found in the fact that the dealers either sacrifice a part of their profit or else the equipment they sell is overpriced, permitting them to be more generous in the amount allowed on the old equipment.

Notwithstanding the above, many conservative financial accountants and cost accountants have stated that the best rule, which will develop a set of bookkeeping transactions most easy to trace and follow, is an arrangement where the old equipment is always sold outright and the resulting loss or gain, whichever it may be in comparison with the net book value, is then taken. Thereupon, the newly purchased item goes into the records at its list price.

Such a set of transactions assumes that the loss or gain in the sale of the old item was due to the inability accurately to estimate the anticipated life of that item. This, it is claimed by these accountants, is easier to support than to assume that the new item is overpriced by the manufacturer, permitting him to be more generous in the allowance granted on the old equipment than otherwise would be the case.

However, not all manufacturers place a price on their equipment which is so high that they can afford to be extra generous when the question of a trade-in is being considered. Therefore, it is best to look at the trade-in from the angle of what effect it will have on your income taxes, particularly so since the Revenue Act of 1938 definitely offers the taxpayer the opportunity for such tax savings.

To be more specific, the 1938 law *excludes from the capital assets classification* "property used in trade or business of a character which is subject to the allowance for depreciation in Section 23 (1)," for Section 117 (a) (1) relating to definition of capital assets says "the term 'capital assets' means property held by the taxpayer . . . but *does not include . . . of a character which is subject to the allowance for depreciation provided in Section 23 (1).*"

New item at $20,000.	
Old item cost $15,000, depreciated $12,000, net $3,000.	
If allowance is LESS than net or only $2,000	
With profitable operations	SELL and take $1,000 LOSS
With loss on operations	EXCHANGE and add $1,000 to value of new item making it worth $21,000.
If allowance is MORE than net or $5,000	
With profitable operations	EXCHANGE and deduct $2,000 from value of new item making it worth $18,000.
With loss on operations	SELL and apply $2,000 GAIN against operating losses.

Consequently, losses on sales or exchanges of property coming within the terms of this exception will no longer be subject to capital loss limitation as they were under the prior Act.

FOR EXAMPLE, consider the following transaction. A new oven is being purchased, and an old one discarded. The equipment might be a freezer or a cooker, but an oven is merely used as an illustration, all the figures being hypothetical. The list price of the new oven to be purchased is $20,000. The old oven cost $15,000 and to date $12,000 of depreciation has been provided so that it has a net book value (sometimes spoken of as "undepreciated value") of $3,000.

Then let it be assumed that the allowance to be received is less than the net value, or only $2,000. Thereupon, two possible procedures can be considered:

(1) If the operations of the business have been profitable, *sell* the old equipment and take a $1,000 net loss by reason of the sale. The new equipment is then on the books at $20,000 subject to the usual depreciation.

(2) However, if the regular business operations to date have resulted in a loss, then effect an *exchange* and add the $1,000 shortage in the allowance as compared with the book value to the price of the new equipment. This then gives the new item a value of $21,000, all of which is subject to depreciation.

But, if the oven builder should offer more than the net book value, or for example, $5,000 for the old equipment, then consider the following two procedures:

(1) With profitable operations to date, effect an *exchange* and deduct the $2,000 of extra allowance compared with the net value of the old item from the list price of the new equipment, bringing into the property records a net figure of $18,000 which is subject to the usual depreciation.

(2) In the event that operations to date have resulted in a loss, then *sell* the old equipment. The $2,000 excess over net value may not be subject to an income tax since it may be offset by the operating losses

(*Turn to page 720*)

PUBLIC RELATIONS IN THE *Food Industries*

These candy plant employees look pretty much alike in their neat uniforms. But they have been with the company different lengths of time and so, on a seniority basis, are not equal. Some of them have first choice over the others when an opportunity presents itself.

SENIORITY *Is Not Simple*

It is an industrial relations problem with many angles, all important.

By EDWIN LAIRD CADY
New York, N. Y.

NOTHING SEEMS SIMPLER than seniority. The man who has been employed the longest should get the first whack at promotion, should be the last to be laid off and the first to be rehired, and should get the best of any other available privileges. Isn't that all there is to it?

That simplicity is deceiving. Seniority has caused more than its fair share of strikes, even when employers and unions have had the best of intentions toward each other. Seniority was largely responsible for the breaking up of the original vertical type unions (the present CIO is a vertical type union) into the horizontal or craft type unions (AFL type). The benefits of seniority are the real, if not the ostensible, reasons for most of the inter-craft jurisdictional disputes. Carelessly handled, seniority can hold back the development of new products and can put the brakes on all modernization of equipment. Like dynamite, seniority is an innocent looking thing which needs to be handled with systematized care.

Seniority is perhaps the most personal or "human" factor in industrial relations. Therefore, no master plan for handling it can be laid down for all plants. Each company must work out its own plan, in accordance with its own conditions. The point is—and any modern labor leader will agree to this—there should be a plan. Otherwise, under modern conditions there will almost certainly be trouble.

A good seniority plan can be built on these four factors: definitions, options, increments and adjustments. Even the biggest and best organized factories, with their carefully worked out definitions of the functions of every employee and department, are apt to run into definition trouble when handling seniority problems. Yet the smaller plants, with their common sense "unwritten" flexibility of having single employees perform many tasks, cannot solve their seniority problems by adopting straight-jacket definitions. Definitions are needed to make policies clear, but they should not go beyond that point.

There is only one seniority plan which needs no definitions to clarify its workings. Under this plan, a man who is laid off can assert his right by seniority to displace any of his juniors in any department of the plant. A senior shipping clerk, for example, might assert his right to take over the duties of a junior cook or tester. Unions have applied this idea to various industries. Would it work in your company?

Under any other plan, seniority must be department by department, craft by craft, or the like. By definitions, the sanest lines of seniority can be laid down and made clear.

There are, however, questions to be answered. By one plan, a senior

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► ***Industry is now giving unparalleled attention to improvement in public relations. Since public relations begin at home, in your own factory, careful attention should be given to employee problems. Seniority is one of these problems, a complex one that causes much trouble yet looks deceivingly simple. Touching as it does upon the many phases of the seniority question, this article contains helpful information for***

All Food Manufacturers

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can only displace his junior if the senior has a degree of skill equal to or greater than that of the junior. But what, in your plant, is a degree of skill? Can the labor be divided into skilled, semiskilled and unskilled categories? Can such division be made within departments, or within crafts, if not for the whole plant?

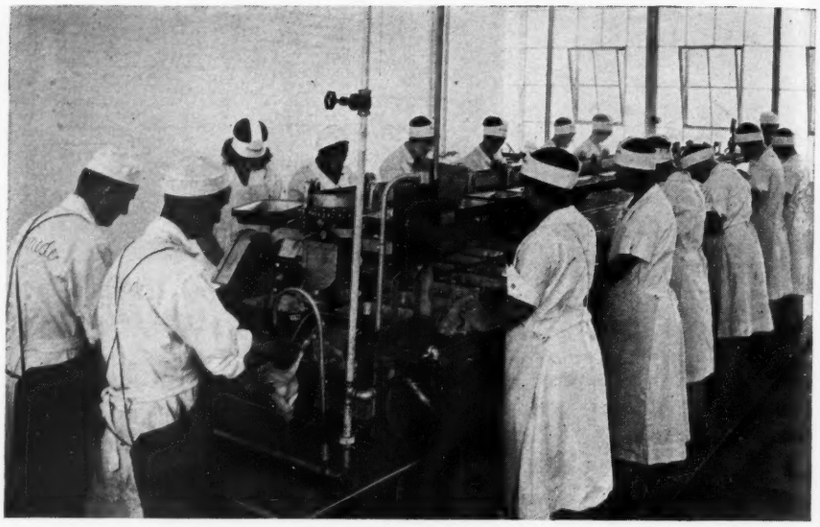
Seniority often carries the right to the less hazardous tasks. But which are the less hazardous tasks, and to what degree? Do the state labor reports, or the insurance company records, give the answers? Or is the record of the plant itself, or the guess of the senior employee, to govern?

Seniority merits promotion. But, by definition, what is promotion? Is shifting to a less hazardous task a promotion? Is it promotion to be given the prior right to learn a new skill, to take a longer vacation or pick the vacation time, to have the first shot at an open foremanship or to get off from the hourly wage and on to the annual salary list? Or is promotion solely a matter of dollars in the pay envelope?

Many strikes have been fought because definitions like these were never thought out. Much bitterness, leading to poor efficiency or "unconscious sabotage," could be stopped if definitions were used to filter the muddy misunderstandings out of seniority problems.

It is easy to get unduly complex about definitions, or to compound some of the kind which make shining targets for the "wise cracking" reds on the soap boxes. But it is just as easy to keep definitions accurate and simple.

At no time are definitions more needed than when deciding who shall have the options—the right to make decisions in conflicts of interests or ideas.



All of these chicken cannery employees are doing the same type of work, perhaps with equal skill. So if some had to be laid off, who would be the victims? Seniority probably would decide the answer.

IN SOME PLANTS, the senior has the option of deciding whether he will or will not change his basis of pay from piece work to hourly rates, change his incentive plan, accept promotion, learn a new skill, work Sundays or holidays, go on night shift, work reduced hours in order to keep his fellows employed, and many other things.

Options are responsibilities. The great stumbling stone of seniority plans is the forced assigning of options in such a way that the employee takes responsibilities which belong to management. When, for instance, an employee who runs a key machine has the option of working overtime or refusing to do so, his option may force him to decide whether or not a whole department works overtime, or even whether or not a whole factory catches up with delivery promises. When he has the option of learning or refusing to learn a new skill, and his seniority makes him the last to be laid off, then he may keep an improved process out of his department by refusing to either learn the skill needed to run it or to work reduced hours so a new man who has the skill can economically be hired. In dozens of other ways his options may give a senior responsibilities which he would rather not have. Factories have been forced to change their locations just to clean slates on options of these kinds.

Options may be divided. They may be assigned to the management, the senior employee, labor unions or an industrial relations committee of some kind.

The option of training new labor, or of permitting it to be trained, may be kept by management, seized by a union or assigned to senior employees. This option goes with seniority when departments or tasks are rented out to groups of employees, as for instance, a tomato-peeling table may be rented or assigned to a padrone and his family.

The option of learning a new skill is a dangerous one. Pride may lead a senior to demand training in a new skill, although he is incapable of doing well at that skill. When this happens, he may "psychologically incapacitate" himself for his former task, but retain his seniority in it. Should this option be his alone, or should he share it with someone who can advise him to his own best interest?

A senior may have the right to be absent for illness without losing his seniority or his work assignment. But in some plants, he also has the option of being absent for the performance of union duties and so forth. When the absence is for reasons other than illness, whose option shall it be to pick the time period during which he is absent?

The assignment of options to industrial relations councils is a growing practice, since it relieves the senior, the management and the union alike from the onus of making arbitrary decisions. But these councils should not have their time dissipated by too many petty problems. Every plant has options which belong naturally to the senior, the management and the unions if unions are in the picture. Let the options be assigned. The council is there to iron out arguments.

The options of seniors can be nuisances to management. On the other hand, there is no greater aid to good industrial relations than for juniors to see their seniors making wise use of wisely assigned options.

Some of the worst problems of options can be solved by intelligent handling of the degrees or increments by which seniority accrues.

When should a new man begin to acquire his seniority? By what increments of time should it accrue? When should it lapse? What increments other than those of time should be used? Here are some ways that

(*Turn to page 717*)

Food Engineering To Be Taught

Oklahoma A. & M. College sets up four-year course to train men for industry

By J. I. KEITH
Professor of Dairy Manufacturing
Oklahoma A. & M. College, Stillwater, Okla.

J. I. Keith, professor of dairy manufacturing and acting head of the new department of food engineering at Oklahoma A. & M. College

MOST SCHOOLS of engineering have been slow to recognize the need for technically trained engineers to operate food factories and distribute the products of these factories. Processing, packaging, selling and distributing foods have been major industries for many years, and these industries are becoming more complex and highly mechanized.

Recognizing this need for specially trained food engineers, Oklahoma A. & M. College, Stillwater, has set up a new four-year curriculum, the completion of which will lead to the degree of Bachelor of Science in Food Engineering. This course is under the Division of Engineering, and will afford students an opportunity to secure specialized engineering training in the processing and distribution of foods.

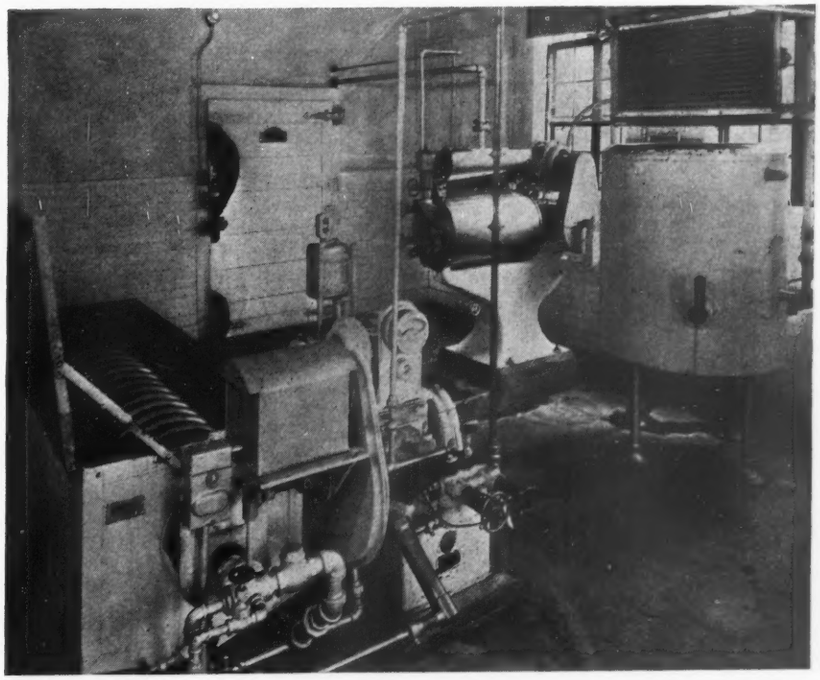
Oklahoma A. & M. College is able to offer this type of instruction by combining basic engineering training and other course work previously given. The manufacturing branch of the Department of Dairying, School of Agriculture, has for years offered courses in processing milk and milk products. These courses will be expanded to include other foods as well. The writer is acting head of the new department of engineering and has been in charge of dairy manufacturing teaching and research for the past eight years.

What has been called "dairy manufacturing" started years ago in dairy production departments in agricultural schools, probably in an attempt to teach farm people how to make better butter, cheese and other dairy products at home or for sale. With the growth of cities, factories and transportation facilities this work has changed to a highly specialized industry which processes, sells and distributes dairy products and it has been for years a distinctly different business from that of producing milk.

These factories are rapidly diversifying, *i.e.*, they are handling other foods as well as dairy products. This trend is being greatly accelerated by the advances in frozen foods. Many plants are now handling frozen fruits, vegetables, fish, and so forth, because they have the necessary refrigeration and distribution facilities to do so.

Many college dairy departments have been reluctant to do research with any products other than those made from milk. While this attitude may have been quite natural and entirely justifiable, still the plants where most dairy manufacturing graduates secure employment are handling other food products and are in need of having research done on these other products by experiment stations.

Dairy departments have not been able to train the kind of men needed in these plants which are rapidly becoming "food processors." The young men who go to work in these plants have little or no contact with the country people who produce the milk, fruit, vegetables, sugar and other foods which are processed and distributed.



Heat exchangers, freezer and homogenizer in one corner of the ice cream making laboratory at Oklahoma A. & M. College

Nevertheless, colleges have gone ahead for the last generation assuming that a boy who gets a degree in dairy manufacturing should spend half of his college time studying such subjects as botany, livestock judging, crop insect pests, soils, feeds, feeding and so forth. It would appear more logical to have him spend this time studying mathematics, food chemistry, mechanical engineering, sanitary engineering, accounting and selling.

Anyone who doubts that dairy manufacturing graduates of our colleges have many handicaps to overcome should examine the record of what these graduates have done and are doing. He should interview the plant managers who employ these young men. Anyone who conscientiously conducts such a study will not have to go very far nor take much time to discover ample evidence of the fact that colleges have not been training the kind of men these plants need. This situation must be remedied. The writer, among others, thinks that the solution to this problem is to establish a department of "Food Engineering."

An engineer must necessarily be good in mathematics. One who processes food products has the same need for mathematical training because he is constantly measuring, weighing, standardizing and utilizing different units of heat, refrigeration, power and so forth.

Food plant processes are, in reality, engineering from beginning to end. They include mechanical engineering (with its thermodynamics and refrigeration), chemistry, sanitation and technical knowledge of the products handled. But college graduates who expect to work in the food processing industries should also have basic training in salesmanship, accounting, business administration and other lines as well as engineering.

Food Engineering Curriculum

Freshman Year

1st Semester

Hours Credit	*Title of Course*
3	General Biology
4	General Chemistry
3	English Composition
0	Engineering Lectures
2	Plane Trigonometry
4	College Algebra
2	Engineering Drawing
1	Military Science
19	

2d Semester

3	General Biology
4	General Chemistry
2	English Composition Laboratory
0	Engineering Lectures
4	Mathematics: Analytics
5	Physics: Mechanics and Electricity
1	Military Science
19	

Sophomore Year

1st Semester

Hours Credit	*Title of Course*
3	Elements of Accounting
4	Introductory and General Bacteriology
2	Essentials of Public Speaking
5	Calculus
3	Mechanics, Statics
1	Machine Shop Practice
1	Military Science
19	

2d Semester

3	Elements of Accounting and Cost Accounting
3	Organic Chemistry of Foods
1	English Composition Laboratory
3	Principles of Economics
3	Calculus
5	Physics: Heat, Sound, Light
1	Military Science
19	

0	Summer Practice (3 months)

Junior Year

1st Semester

Hours Credit	*Title of Course*
3	Merchandising
3	Advanced Food Chemistry
3	Elements of Milk Products
3	Industrial Organization
3	Steam Power Plants
1	Steam and Gas Laboratory
3	Thermodynamics
19	

2d Semester

3	Merchandising
4	Introductory Physical Chemistry
4	Beverages (includes milk)
5	Food Bacteriology
3	Refrigeration
19	

0	Summer Practice (3 months)

Senior Year

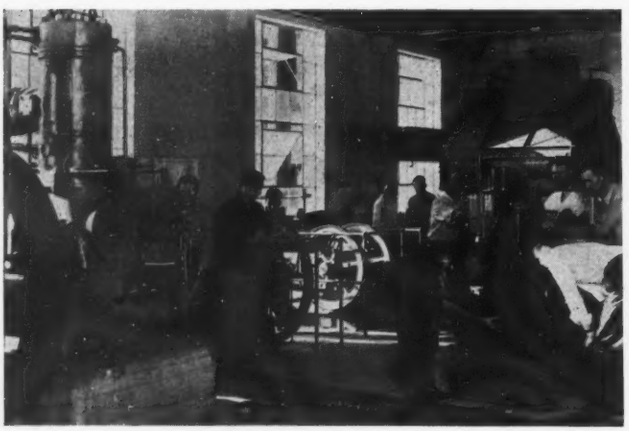
1st Semester

3	Personnel Administration
3	Colloid Chemistry
5	Strength of Materials
3	Industrial Management
1	Foods Seminar
2	Elective
17	

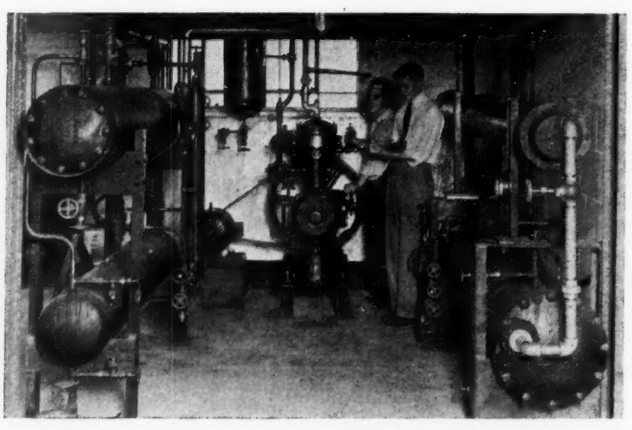
0	Food Plant Inspection Trip

2d Semester

5	Principles of Electrical Engineering
1	Safety Engineering
4	Butter, Cheese
4	Frozen Foods (includes ice cream)
1	Foods Seminar
2	Elective
17	
148	



Students at work in a section of the new mechanical engineering laboratory at Oklahoma A. & M. College

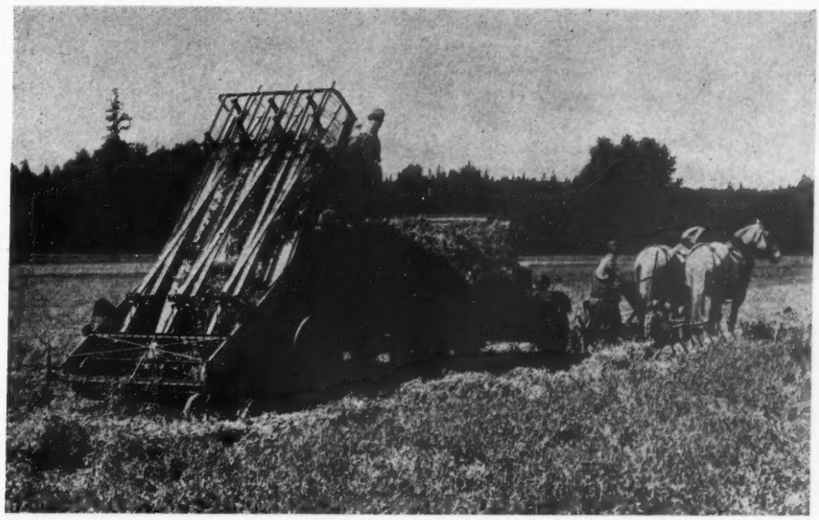


Future food engineers obtaining operating data on an experimental refrigeration unit at Oklahoma A. & M. College

Quick Freezing Foods
With Multi-Stage Tubular Freezers

System installed at Chehalis, Wash., provides economy and convenience for freezer of fruits and vegetables. Cost data given

By W. J. FINNEGAN
Consulting Engineer, Los Angeles, Calif.



Harvesting peas within three miles of the Chehalis plant.

PART II
How the System Operates

FREEZING OF FRUITS AND VEGETABLES by the equipment described in Part I of this article (see FOOD INDUSTRIES, November, 1938) is carried on at the Chehalis, Wash., plant of National Fruit Canning Co. This plant installed a Multi-Stage Tubular Freezer of 2,000 lb. per hour capacity, which started commercial freezing operations on June 9, producing frozen sliced strawberries in 2½ and 5 lb. brick form for the institutional trade.

Production of frozen foods was no new venture for National Fruit Canning Co. In fact, this concern pioneered in freezing by the cold-pack method more than twenty years ago, and started freezing vegetables in 1932. Approximately 5,000,000 lb. of fruit and vegetables was frozen by National Fruit Canning in 1937, and 1938 production is expected to be as great.

The location of the Chehalis plant is especially suitable for freezing operations. A large number of proved varieties of fruits and vegetables are grown in the vicinity. This permits close supervision of planting, growing and harvesting, assuring the freezing plant of the quality of its raw material. It also affords relative short hauls from field to factory, thus enabling the plant to freeze only freshly harvested products.

These factors are extremely important in the production if high quality frozen foods. Freezing does not improve the quality of fruits and vegetables. As a matter of fact, the relative utility of any freezing system, as far as product quality is concerned, should be determined by the amount of physical and chemical deterioration occurring in such products during the freezing process. Best results are obtained by freezing suitable products as soon as possible after harvest and by a method causing the least possible deterioration.

AMONG THE PRODUCTS frozen by National Fruit Canning Co. at Chehalis are peas, corn on cob, cut corn, beans, spinach, asparagus, and many Northwest fruits and berries. These products are packed in various containers, including 12 oz., 1 lb., 2½ lb. and 5 lb. cartons; 5 lb., 10 lb., 15 lb., and 30 lb. tins; and 30 gal, and 50 gal. barrels. This company pioneered the commercial market in the packing of 30 lb. cans, and was the first to pack 1 lb. cups for retail distribution.

Pea processing and freezing at Chehalis gives a good example of the operation of the new freezing equipment. Planting, growing and general care of the pea crop is supervised by company field men, who also oversee the cutting and vining. Peas are delivered to the plant in field lugs, and first pass through a specially designed pea feeding governor. Next the peas pass through a cleaner and washer and then through a custom-built grader. The next step is blanching, carried out in a specially-designed steam blancher, utilizing temperatures ranging from 192 to 211 deg. F. for 72 seconds, the temperature depending upon the maturity of the peas.

Initial cooling after blanching is by water sprays located at the discharge of the blancher. The peas then pass by gravity flow through a 160 ft. water flume. Here they are cooled and conveyed by the water to separators, where the water is removed. From the

separator discharge, the peas pass onto either of two inspection belts. On these belts, which are each 16 ft. long and 2 ft. wide, the peas are individually inspected by experienced workers. Choice peas are discharged from the inspection belts into wooden baskets with wire screen bottoms, in which they are conveyed to the final cooling and storage tank. This storage permits the processing equipment to be shut down for minor adjustments or repairs without interrupting the steady flow of peas to the freezer.

Baskets, each holding approximately 30 lb. of peas, are trucked to the freezer. The peas are then spread on the freezing trays, placed in trucks, each accommodating ten trays. These trucks then pass through the freezer, which was described in Part I of this article, FOOD INDUSTRIES, November, 1938.

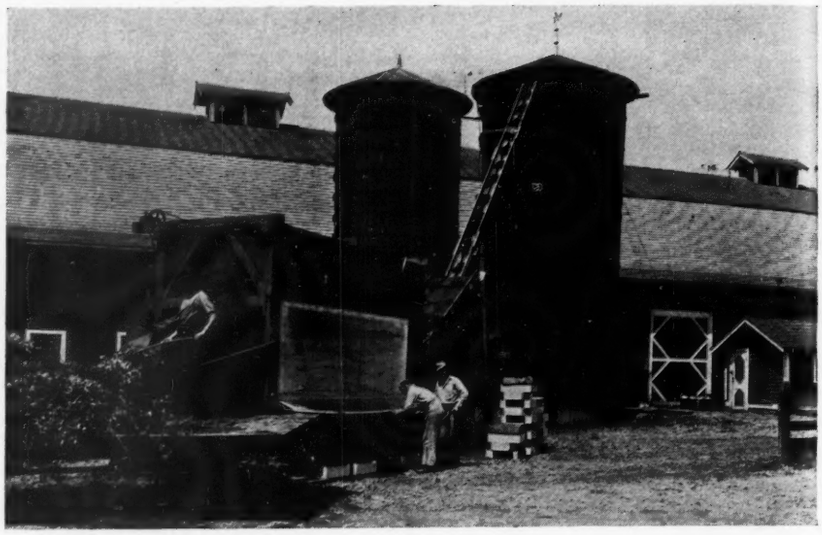
When the trucks with the loads of frozen peas are discharged from the freezing tube, the peas are placed in a storage bin. An elevator moves the peas from this storage to the package fillers. A temperature of 5 deg. F. or lower is maintained in the air about the peas until after packaging is completed.

Package fillers are custom built, and designed to accommodate adaptors for accurate filling of various containers. The 12 oz. to 5 lb. wax paper cartons are of the end-opening type and are fitted with a preformed and heat sealed transparent cellulose bag with one end open for filling.

Cartons are filled, check weighed, end of bag heat sealed, and end of carton closed. They are then placed on a belt running through the center of a wrapping table. Here, air and moisture-proof wrappings are placed on the cartons and heat sealed. The belt conveyor then takes the cartons to the end of the wrapping table, where they are packed in fiber board shipping containers, and then put in storage at 0 deg. F.

The design and arrangement of the equipment installed in this Chehalis plant of National Fruit Canning Co. would not necessarily fulfill the needs of another plant, even in the same locality. It was designed to meet, economically, the individual requirements of this plant. Many conditions other than the freezing requirements had to be considered in order to keep initial costs and operating expenses at a minimum.

For instance, the city of Chehalis has a comparatively low water rate, and has a reliable supply of good quality water at 60 deg. F. and 90 lb. pressure. Mainly because of first cost, full advantage could not be taken of this condition through the use of any refrigerant condenser of standard manufacture. Therefore it was necessary to design a special horizontal multi-pass shell and tube condenser using small tubes with unusually high water velocity, resulting in approximately 70 lb. drop in water pressure. This effected a 40 per cent saving in initial cost, as well as a substantial saving in water and power costs. If it had been necessary to pump the water, this condenser would have been unsuitable as its operating costs would have been too high. However, with a 90 lb. pressure supply available, the condenser met all requirements in an economical and efficient manner.



Vining peas for the Chehalis plant. Note the field lug boxes in which the peas are transported to the plant.

Refrigeration is supplied at Chehalis by a 7½x7½ in. two-cylinder vertical single-acting enclosed type ammonia compressor. This is driven by "V" belts from a 50 hp. induction motor. Auxiliary refrigeration equipment includes two Low-Side float control valves to regulate the liquid level and supply refrigerant to the freezer. The refrigerant suction line from the freezer to the compressor is oversized, to permit doubling of the freezing capacity in the future. The complete high-pressure side is built as a single unit, the receiver having sufficient capacity to store the entire charge of refrigerant. Air circulation in the freezer is by means of double inlet conoidal fan, handling approximately 32,000 cu.ft. of air per minute against a total head of 1¼ in. (water gage). This fan is driven by "V" belts from a 10 hp. induction motor. The freezing truck conveyor is driven by a ½ hp. motor.

These three motors, totaling a connected load of 60½ hp., provide all the power necessary for use in freezing 2,000 lb. of produce per hour. With some other quick freezing methods, from 50 to 100 per cent more connected horsepower is required to produce an equal output of frozen product, regardless of quality. In fact, this connected power load is less than would be required in a commercial ice plant of like ice-making capacity. Normally, a 10x10 in. two-cylinder compressor with a 75 hp. motor is used, operated at zero suction gage pressure, or –28 deg. F. evaporating temperature, with recirculated heat transfer fluid temperatures ranging from 12 deg. F., to –10 deg. F. to obtain this freezing capacity. The use

One of the two final pea inspection belts used at the Chehalis plant.

of booster compression, multi-stage or compound compression would not lower this horsepower requirement, and any lowering of the evaporator temperature would inversely affect the horsepower required per unit quantity of frozen food produced.

Under actual commercial operating conditions, total operating costs were compiled at Chehalis, using peas, one of the major products, for the test. The findings were based on a normal production of 560 tons of frozen peas per year of 40 days operation, with an average of fourteen hours per day. The test indicated that the total operating cost incidental to all freezing operations was $0.00284 per lb. or $5.68 per ton of peas frozen and stored. This cost includes interest on initial investment, maintenance and depreciation, taxes, insurance, labor and supervision, power, and water. It does not include cost of electric light, or any storage time after freezing. The overhead figure was obtained by assuming an amount equal to 16 per cent of the entire initial investment, which provided 6 per cent interest on this investment, 7 per cent for maintenance and depreciation, and the remaining 3 per cent to cover taxes and insurance. Since this total annual overhead was applied to 40 days of operation, it was undoubtedly a conservative figure. However, in view of the numerous other uncontrollable conditions affecting the supply of suitable raw material, the use of this conservative figure was thought to be advisable.

Further tests conducted under commercial operating conditions indicated that the new freezing method effected a saving in product weight, because of the minimization of dehydration, of over 50 per cent, when compared to the freezing method previously used at this plant. This increase in product weight effects a saving approximately equal to the entire operating costs, without any consideration of the obvious improvement in quality and appearance of the product.

Loading trays of peas in freezing truck before precooling and freezing

On the subject of freezing costs, a recent article ("Quick Freezing Methods," by Ralph V. Grayson, *The Canner,* April 2, 1938, page 18) states that all quick freezing methods vary little in this respect and that "A general idea of the cost of quick freezing, as might be adapted to a canning plant, can be safely estimated at $7 per ton for quick freezing and handling." A more recent article ("Multi-Stage Ammonia Compression Systems for Low Temperature Work," by Ralph V. Grayson and H. L. Fischer, *Ice and Refrigeration,* August, 1938, page 82) tells of a plant with a freezing capacity of 1,500 lb. per hour that would cost approximately $20 per pound of hourly capacity, or $30,000 total. It was further pointed out that the operating costs of such a plant would be "less than ½ cent per pound, based on 24 hours daily operation during freezing season, which is assumed to be 50 per cent of the year."

If frozen food producers could bank on the operating load factor given in that article, there would be no need for concern over the meager item of operating costs. On the other hand, if the plant mentioned in the quoted article had to be content with the normal load factor prevailing in the average freezing plant, the item of ½ cent per pound would not pay the 16 per cent overhead of $11.42 per ton, much less the operating costs. No offense is intended in this explanation. I merely feel the need of making clear certain points which might otherwise be confusing to the casual observer.

Many frozen food producers now realize that the economical production of uniform, top-quality frozen foods cannot be satisfactorily accomplished by the trial and error method; that the proper application of known fundamentals is essential; and that specialized engineering is required to obtain full advantage of all favorable conditions and to minimize the affect of unfavorable factors. The importance of this course is far reaching and fully justifies consideration by those engaged in or proposing to take up the production of frozen foods.

Filling and wrapping packages of frozen peas at the Chehalis plant.

QUICK FREEZING With Portable Units

Z Pack freezing unit operating on four kinds of berries gives flexible and efficient service to packer

By HARRY A. NOYES

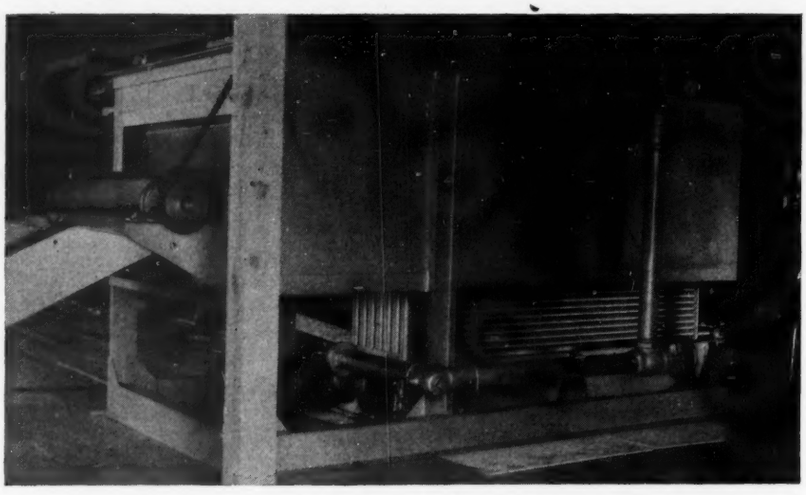
Food Technologist, Arthur D. Little, Inc., Cambridge, Mass.

EARLY IN MAY, 1938, Craddock & Craddock, Inc., food processors and canners, trucked a Z Pack portable freezing unit to its Dyersburg, Tenn., plant in order to freeze strawberries, youngberries, dewberries and blackberries individually. The portable plant was built in two parts, the refrigerating machine and the Z Pack freezing unit proper. The refrigerating machine was a regular 7x7 in. Frick compressors with motor and other parts all mounted on a sturdy welded steel frame. The Z Pack machine included the freezing tunnel, which carries the freezing belt, spray distributing system, pump, motor, tank, heat exchanger and ammonia temperature regulator, all built together as a unit inside a welded steel frame, which can be easily pushed on its own casters to any location on any factory floor.

Connection of the electric power supply to the various motors, water to the ammonia compressor, and two pieces of flexible piping between the refrigerating machine and the heat exchanger, completed the plant ready for use. Keeping the products below freezing temperatures, during packing after they had been frozen, was facilitated by erecting a collapsible balsa wood room at the outlet end of the machine.

At Dyersburg, Tenn., only fruits were frozen and, therefore, an approximately fully inverted sugar syrup, which carried about 50 per cent sugar solids, was the freezing agent used. This sugar syrup was sprayed into the freezing chamber at the rate of 220 gal. per minute, then recooled and recirculated. The complete charge of liquid in the machine at any time was approximately 150 gal., or in other words 75 per cent of the amount of fluid which was circulated every minute. The syrup flowing down over the heat exchanger of the Baudelot type, kept flooded with liquid ammonia, was the source of the cold to carry out the freezing. The movements of the cooled, sprayed syrup over the entire surface of the products in the freezing tunnel carried out the freezing operation.

Producing refrigeration, preparing the fruit, freezing the fruit, and handling the frozen product are, in effect, an abbreviated outline of the operations that were carried out at Craddock & Craddock, Inc., plant at Dyersburg, Tenn. The ease with which these steps were accomplished, the rapidity of the Z Pack freeze, and other points about the operation are evident from the following description.



Z Pack portable quick freezing unit, with insulated bottom panels removed to show liquid cooler and pump. This is the type of equipment used by Craddock & Craddock, Dyersburg, Tenn., as described on this page.

As an example, a truck carrying 300 crates of strawberries came into the plant about eleven o'clock in the morning. The strawberries had been picked that morning and were about 80 deg. F. in temperature (which was the air temperature of that day). Women started capping the berries and then placed the capped berries back into quart boxes which, in turn, were assembled in crates. About fifteen minutes before they were ready to begin washing and sorting, the compressor was started and the sugar solution was circulated through the freezing tunnel and over the cooling coils. The temperature of the solution was lowered at a rate that averaged a little over 2 deg. F. per minute, and fifteen to twenty minutes was all that was needed to bring the sugar solution down to a range of 14 to 16 deg. F. In operation, when the temperature got to 14 deg. F., a thermostat cut off the compressor and then when the temperature had risen about 3 degrees the compressor automatically turned on again. The strawberries, at the end of the twenty-minute period, were coming off the picking table. They were collected in pans and distributed evenly in layers about 1 in. thick over the moving belt of the Z tunnel, which is a little over 4 ft. wide. It took about 1½ minutes for the berries to travel from the place where they were put on the belt to the curtain where they came in contact with the freezing sprays. Freezing was so rapid that berries

Outlet end of Z Pack portable quick freezing unit at Dyersburg, Tenn., with frozen berries on the drainage screen.

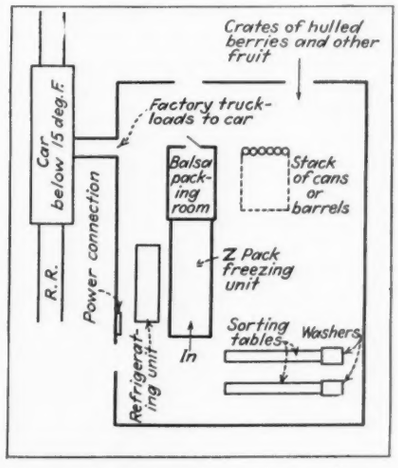
were actually frozen solid in less than ten minutes. The speed at which the belt went through the freezing tunnel was, however, set so that it took about 16 minutes for the belt to travel the 16 ft. of the zone that was subjected to the action of the freezing sugar syrup.

"Quick freezing" was not a problem with this application of the Z Pack system, as heat can be extracted so rapidly by the close contact of liquid with all the surface of the product to be frozen that every available bit of heat exchanger and compressor capacity is quickly utilized. If the berries to be frozen are larger than usual, the freezing time is not appreciably changed, because when fruit is frozen from the surface the entire surface of the fruit is used and a large proportion of the weight of the fruit is near the surface. If, however, a little longer time was desired in the tunnel, a twist of the wheel slowed down the speed on the traveling belt. Sixteen minutes from the time berries were started into the machine, frozen berries began to roll off the conveying belt into a prepared sloping receiver. They hit on this and rolled along with a sound similar to "hail stones on a tin roof." They were collected in a hopper from which they were weighed into cans, barrels or smaller packages.

If the plant ran out of fruit sometime during the day or night, it was only eighteen minutes before the freezing machine was empty, and in twenty minutes the whole plant was shut down. Twenty minutes to shut down and twenty minutes to start gives an ease of operation and an adaptability which is not possible with many other types of equipment.

The frozen berries are moist on the surface as they come from the freezing machine—the moisture is the sugar syrup—and the amount retained is a little more than the weight of water that is ordinarily retained when berries are washed.

The depletion of the syrup supply by the quantity taken off on the berries makes adjustments in the freezing solution necessary from time to time. It is desirable to have the fruit take off syrup, as sugar keeps color and flavor of fruit products



Layout of the quick freezing equipment at the plant of Craddock & Craddock, Dyersburg, Tenn., showing relation of the Z Pack portable freezer to other parts of plant used to freeze berries.

while they are in storage, and it has been demonstrated that this sugar improved the quality and characteristics of frozen goods. The solution is brought back up to strength and volume by addition of sugar syrups, which are very much stronger than those that could be used in the freezing system and in regular factory runs. This addition of syrup becomes just about as regular as the feeding of the unfrozen fruit onto the freezing belt. It was customary at Dyersburg to add 5 gal. of invert sugar syrup every 45 minutes, pouring it into the pan at the receiving end of the tunnel.

Not all plants and not all processes can be run continuously, because power sometimes goes off and other accidents occur. When power went off there was never over 200 lb. of fruit on the belt, and over half of that was found to be completely frozen when it was turned out of the machine by hand power. It would have stayed in the machine for a half hour to an hour with the sprays turned off without any damage.

This process has been used on berries of three sizes without stopping the machine, or any other interruption, by simply leaving a space of a foot or so on the belt between the sizes of fruit. Youngberries have followed strawberries, and dewberries the youngberries, all in the course of one hour. On two or three occasions loads of only fifteen crates of berries came in, and the machine has been started and operated by two individuals for these small lots.

In operation, one man has plenty of time to look after the refrigerating and technical aspects of the process while working on the feeding end of the tunnel. This would include occasionally checking the operation of the compressor, maintaining temperature, making slight changes in the rate at which the belt moves through the freezing tunnel, adding solution, and any other necessary operations. The supplementary labor required is one man to bring the fruit from the sorting tables to the machine, a man to weigh the fruit into the containers and one individual to take the filled containers away to the refrigerator cars or storage rooms.

During three weeks, four kinds of berries were brought into the Dyersburg plant from an area comprising sections of Tennessee, Missouri and Arkansas. All were handled naturally, easily and efficiently with local help and personnel who had previously had no experience with quick freezing operations.

NEW TECHNICS
In Straight Line Production

Efficiency improved in already efficient pork cutting department

By A. D. DONNELL
Rath Packing Co., Waterloo, Iowa

▶There is perhaps no production line in the whole food industry where so much food engineering is used as in the pork cutting operations. Here is highly efficient continuous straight-line production under conditioned air and in sanitary surroundings. This article describes the last word in hog cutting operations, making it of practical value to

All Food Executives and Engineers

IMPROVEMENTS involving basic changes in food plant practices have been incorporated in the new cutting department of The Rath Packing Co., Waterloo, Iowa. These improvements were made for the sake of greater efficiency, higher quality of product and improved sanitation.

Pork cutting departments have for many years been models of efficiency, not only in food plant practice but in general industrial operations. It is said, in fact, that the automotive industry got from the meat packer ideas which made its assembly line what it is. And the Rath cutting department has gone beyond the efficiency of the ordinary packing house, not only by new technics in certain operations but by adopting new principles of production. In this plant, the trimming of cuts is done in the cutting room in continuous production, not in a separate trimming department. This is not entirely new in the packing industry, having been adopted by one or two other packers recently. But the practice of packaging fresh cuts in this department in continuous production is an innovation.

Both practices eliminate departments formerly needed, along with the equipment, building space and labor required to operate those departments and to move the products to and through them. Furthermore, these practices eliminate piling up of the product, avoid delay in moving it to the coolers or to the next operation and eliminate considerable rehandling.

The new building housing the cutting department incorporates features of good food plant engineering too. Not only are the floors of hard, easily cleaned brick with many drains, but the walls are of glazed tile. Nothing need be said about the contribution of this construction to good sanitation in the plant. Furthermore, the foundations for the equipment are of solid concrete, elevated above the floor. This arrangement, together with a drainage system for each foundation which keeps water off the floor, makes it easier to keep the plant clean and the product wholesome. The equipment, likewise, is easy to clean, being for the most part of stainless steel, with some tables of clear maple.

Protection for the product is provided too by conditioned air in the cutting room. The temperature is kept low enough so that the meat does not warm up unduly in passing through the room. The dewpoint of the air is held below the temperature of the incoming carcasses so that moisture does not condense on the meat.

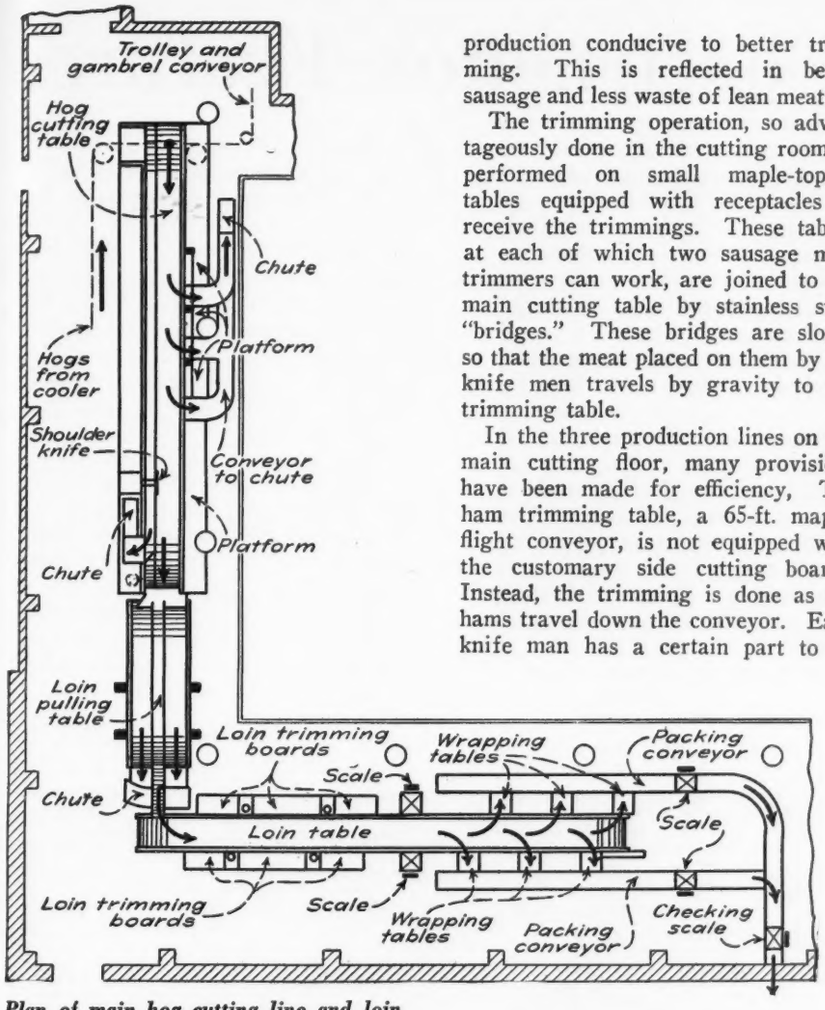
The production plan that makes more efficient the already efficient hog-cutting department is shown in the accompanying floor diagrams. As indicated, the operations are conducted on a balcony and on a main floor below the balcony.

The operation in which 1,000 hogs may be disassembled each hour with ease starts at the hog-cutting table on the balcony. Lowered by monorail and trolley from the cooler on the floor above, the carcasses are divided into the primal cuts, hams, shoulders and sides, on this table. The hams are scribed with a power saw and cut off. Then they slide down short chutes which take them to a conveyor that in turn transports them to a chute leading to the ham-trimming table on the main floor.

Next, the sides are spotted for cutting off the shoulders, done by a large circular revolving knife. Spotting in the correct position on the moving table, or conveyor, is done with the aid of a shadow cast by a wire, this shadow falling on the table ahead of the knife. The removed shoulder drops by a chute located just beyond the shoulder knife, to the shoulder ribbing table on the main floor. The sides of the hog, minus hams and shoulders, pass directly to the loin pulling table, which consists of three parallel conveyors. There are hooks on the two outside conveyors, these holding the sides while the ribs are scribed with a power saw and the loin pulled by men who draw their knives opposite to the motion of the conveyor.

The severed loins are carried by the center of the three conveyors, which operates at a higher speed than the others, directly to the loin-trimming table. The sides go by chute to the ribbing table on the floor below. This loin trimming table is a special feature of the loin trimming and grading operation. It carries the meat past trimmers working on boards alongside the conveyor, and each loin is trimmed immediately. This means that the product is handled fresh and is not piled up awaiting either trimming, wrapping or packaging. The trimmings removed at the loin trimming table go by chutes to a retrimming table on the main floor.

AS THE TRIMMED LOINS travel along the conveyor, they pass scales where men grade them by weight and place them back onto the conveyor in a position which indicates their weight classification. Then they move along the conveyor until removed by men working at wrapping tables alongside the conveyor, the work of these men being greatly facilitated by the pre-arrangement of the loins on the conveyor according to their weight. The wrapped loins are boxed and weighed and put onto packing conveyors paral-



Plan of main hog cutting line and loin pulling, trimming and packaging line on balcony. Note complete, continuous production line for loins.

leling the wrapping tables. A gravity conveyor carries them to a checking scale and into the cooler for storage.

All subsequent cutting department operations are on the main floor to which the various cuts have traveled by gravity chutes. On this floor are the ham, shoulder and side (or belly) production lines, arranged in parallel.

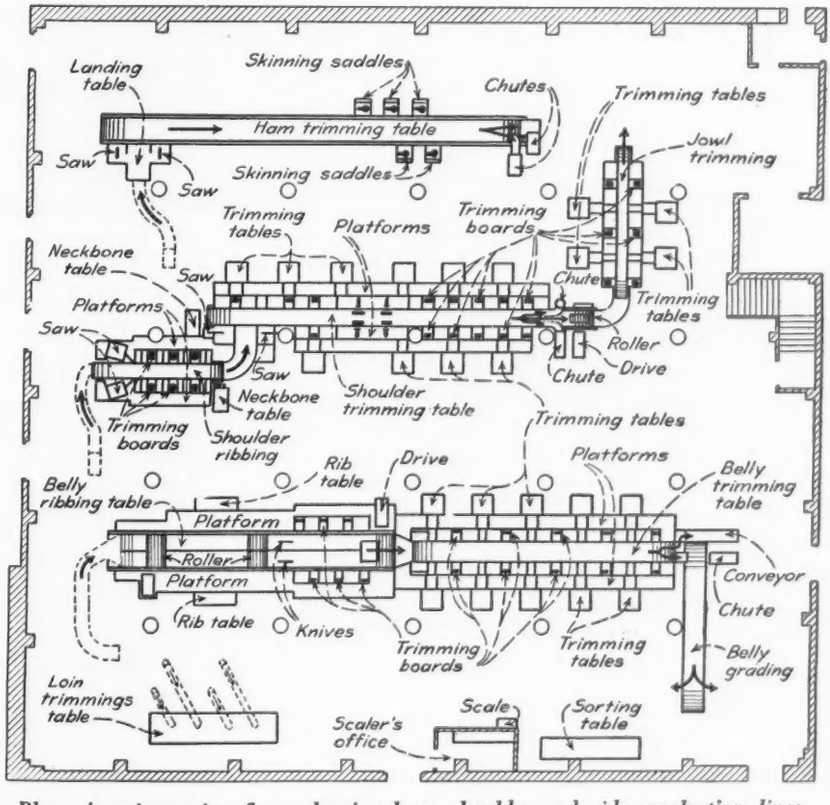
Ample floor space permits the operations to be spread out to allow trimming of fat adjacent to the cutting tables instead of in a separate department as is customarily done. This eliminates the installation of chutes for delivering the fat to a trimming room on a lower floor. Nor is that the only advantage. The delay in moving the fresh pork, a highly perishable product, through the process is avoided, and piling it on tables preliminary to trimming is eliminated. Both of these changes contribute to better quality in the finished product. In addition, the trimmers working on this floor are paced by the knife men behind whom they work, so that they strike a steady, even, unhurried rate of production conducive to better trimming. This is reflected in better sausage and less waste of lean meat.

The trimming operation, so advantageously done in the cutting room, is performed on small maple-topped tables equipped with receptacles to receive the trimmings. These tables, at each of which two sausage meat trimmers can work, are joined to the main cutting table by stainless steel "bridges." These bridges are sloped so that the meat placed on them by the knife men travels by gravity to the trimming table.

In the three production lines on the main cutting floor, many provisions have been made for efficiency, The ham trimming table, a 65-ft. maple-flight conveyor, is not equipped with the customary side cutting boards. Instead, the trimming is done as the hams travel down the conveyor. Each knife man has a certain part to do in the trimming. One man, for instance, does nothing but remove the tails. Four trim and four mark the collar and skin the flank and cushion side of the ham. Six men remove the hams to skinning saddles and remove the skin with draw knives. A grader situated ahead of the skinners indicates which hams are to be skinned and which are not by the position in which he places them on the conveyor. At the end of the ham-skinning table are two spiral chutes leading to the curing department in the basement. One chute is for skinned hams, the other for regulars. The hams are so placed on the conveyor after final inspection as to be carried to the proper chute.

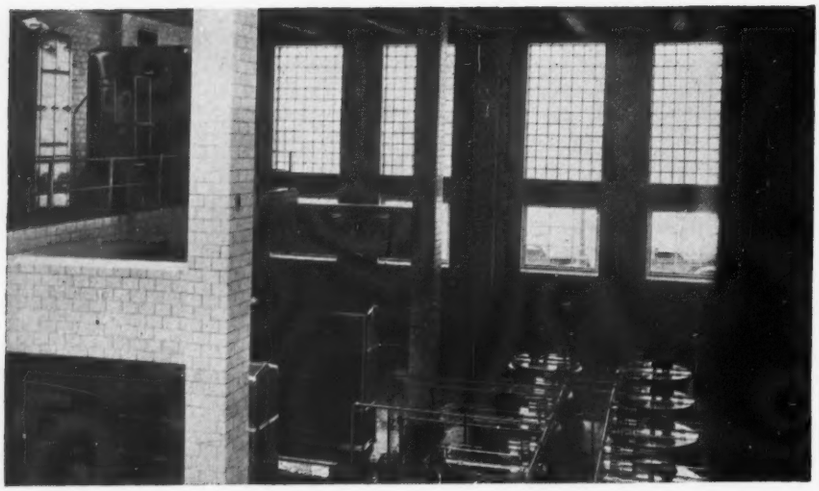
The middle production line on the cutting floor is for shoulders. These are received from the balcony at a ribbing table. Here the boning is done and the feet removed. Then the shoulders go through band saws to a second conveyor table, where the butts and picnics are trimmed and the plates removed. All of these cuts remain on this conveyor until they reach the chute which takes them to the curing department or until they are boxed for the fresh meat trade, the latter being done in the cutting room. The jowls pass under a roller at the end of the shoulder table and go to a third

(Turn to page 707)



Plan of main cutting floor, showing ham, shoulder and side production lines. Note arrangement of small trimming tables with wide aisles.

Construction Features



View of the processing department as seen from reception room window. Construction of ceiling, walls and balcony can be seen. Note also glass brick in outside wall.

PARAMOUNT IN THE MINDS of the Sheffield management when planning the new building at 57th St. were the following: a plant that would be practical and economical in operation; a structure that would have very little maintenance expense; the use of materials that could be easily cleaned and would be highly sanitary; and a building that would adapt itself to changes in equipment or in plant operation. A style of architecture was desired which would be pleasing, would not have a typical industrial appearance, and would not be dated or soon outmoded.

The building is three stories high—a steel, concrete and brick structure that measures 200 ft. on Eleventh Ave., 450 ft. on 57th St. and 550 ft. on 56th St. Part of it is built over the depressed railroad tracks of the New York Central Railroad's new "West Side Improvement." There are basements located to the east and west of the railroad right-of-way, these basements being connected by means of four passageways directly above the tracks and beneath the first floor of the plant.

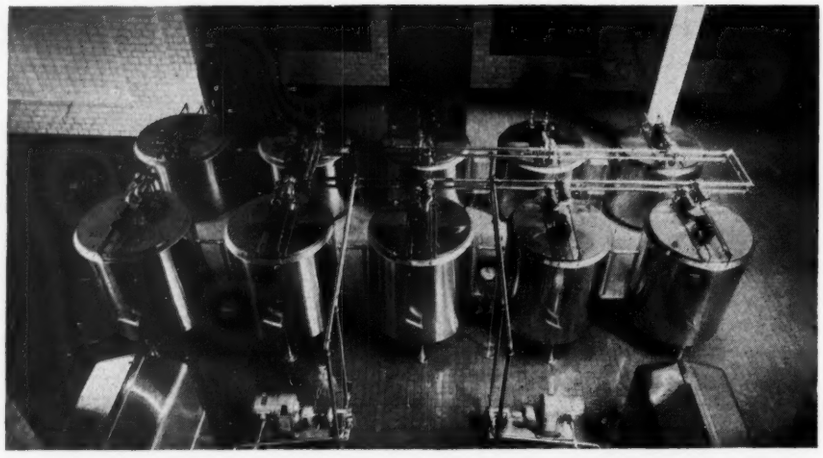
Some idea of size may be obtained when it is considered that in the superstructure 1,376,850 brick, 92,460 bags of cement, 393 tons of reinforcing steel and 3,847.5 tons of structural steel were used.

In style of architecture, it is of modified Colonial design, with polished granite base, limestone trim, smooth red face brick and wood sash windows. The granite base, selected for durability, is polished and has the advantage of not being marred, and marks can be easily removed from it. The red face brick is dense, with low absorption. Use of this same make of brick at a number of other locations shows that rains keep the surface washed clean and do not force dirt into the brick. The mortar brick joints are half round in shape and smoothed with a rounded tool, which gives a smooth surface for rapid runoff of rain. This is important in view of the amount of foreign matter in the air, as the building is located near a large power plant and incinerator.

The wood sash, typical of Colonial design, avoids the industrial appearance and provides a style that will be good indefinitely. All types of sash have been used by Sheffield Farms during its long years of existence, and wood sash has proven the most satisfactory. In addition to long life and requiring less maintenance, it does not collect condensation as readily as metal, it provides a greater ventilating area, is easily cleaned and can be readily screened.

Because the building was long, provision had to be made for expansion and contraction due to temperature changes. Two 1-in. expansion joints were run through the entire building from street to street and from basement to roof. The steel connections at the columns are so arranged that the steel members can slide on one another. A slot was left in the floor slabs and roof, and a flexible, water-tight member inserted. A slot also was left in the outside brick walls and entirely through one ice box. In addition to these structural provisions, it was necessary to bring all electrical conduits out at these joints and arrange all piping at these points so that it is free to move.

There are certain conditions that prevail in milk handling plants, due to the nature of the operation, that are extremely hard on a building and result in high maintenance expense and rapid deterioration. Not only must milk equipment be kept scrupulously clean, but the building as well, in view of the nature of the product handled. As a result, there is an unending clean-



View of part of processing department as seen from balcony. Construction of "packinghouse" tile floor can be seen. Note also glass brick in wall between processing room and equipment washroom.

at 57th STREET

Largest dairy plant in world constructed for low maintenance, easy sanitation and flexibility for future changes of equipment or operation

By H. McNABB

Chief Engineer, Sheffield Farms, Inc., New York, N.Y.

ing operation carried on, dependent, in the main, upon the copious use of hot water and steam. The materials that compose the structure are subjected, therefore, to excessive moisture due either to the direct action from hosing-up and washing operations or to condensation from heavily moisture laden air.

In ice boxes, where the bottled product is held until time for distribution to the route vehicles, this condition also exists. Milk must be kept cold but must not be permitted to freeze. Hence, the temperature of the boxes must be maintained above 35 deg. This temperature, above the melting point of ice, causes excessive condensation on the chilled surfaces of the ice boxes as the ice surrounding the bottles in the milk cases gradually melts.

To meet these conditions and to provide materials that would be attractive in appearance, easily cleaned and would remain sanitary over a period of years required careful selection.

The material chosen for finishing the floors in the milk handling rooms, ice boxes and engine rooms was "Packinghouse tile." This tile is highly resistant to milk waste and washing compounds and has very little water absorption. Along the loading platforms and in areas where milk cans are handled, cast iron grids were embedded in the cement floor finish to resist wear and tear.

The base for the floors is a stone-concrete slab reinforced with steel rods. Over this is laid three-ply membrane waterproofing, on top of which was installed concrete fill and cement floor finish. In the areas where the packinghouse tile is used, the tile was laid over the concrete fill in waterproof mortar. Where no tile covering is employed, the concrete fill is reinforced with steel mesh to prevent its cracking. In the garage areas, the cement floors were treated with waterglass to make them resistant to grease and oil.

The floors are designed for a loading of 150 lb. per square foot in the garage areas; 350 lb. in the first-floor milk area; 300 lb. in the second-floor milk area; and 300 lb. in the main driveways and loading platforms. These loadings are for the steel work. To take care of concentrated loads from equipment, or wheel loads, all concrete floor slabs were designed to carry a 25 per cent greater load than the steel. This provision for taking care of concentrated loads permits of locating heavy equipment at any place throughout the milk handling section of the plant.

The excessive amount of moisture and steam which exists in a milk plant quickly deteriorates painted surfaces. To eliminate painting maintenance, extensive use was made of a glazed tile that is impervious to moisture and mechanical injury. The material covers the walls, from floor to ceiling, in all milk handling rooms, ice boxes, stair halls and offices. In all instances, it is laid in waterproof mortar. Three different grades of wall tile were employed. That in the processing room is a white ceramic material, making a very attractive setting for the stainless steel equipment on the red tile floor. In other milk handling areas, salt-glazed tile is used, this being less expensive. In the garage and engine room, the material in the walls is face brick, still less expensive but yet hard and durable. The lower part of the walls in the garage and engine room are dark red brick to prevent soiling, the upper part being buff colored.

Painting ceilings involves as much maintenance expense in food plants as does painting walls. Sheffield did away with that, too. The ceilings at 57th St. are of dense concrete, made very smooth by pouring in plywood forms. With ceilings of this material, no paint is needed. The extent to which the elimination of painting was worked out can be appreciated when one considers the fact that in a building costing over a million dollars, only $3,600 was expended for painting.

In place of the conventional skylights, which require painting and glass replacement, vault lights were used. These vault lights consist of glass sections, 1-in. thick, embedded directly in the concrete slab forming the vault light opening. These require no painting, and glass breakage in them is practically nil. Moreover, the thick glass is a better temperature insulator than skylight glass.

Also contributing to the low maintenance expense is the glass brick used in various places in the plant.

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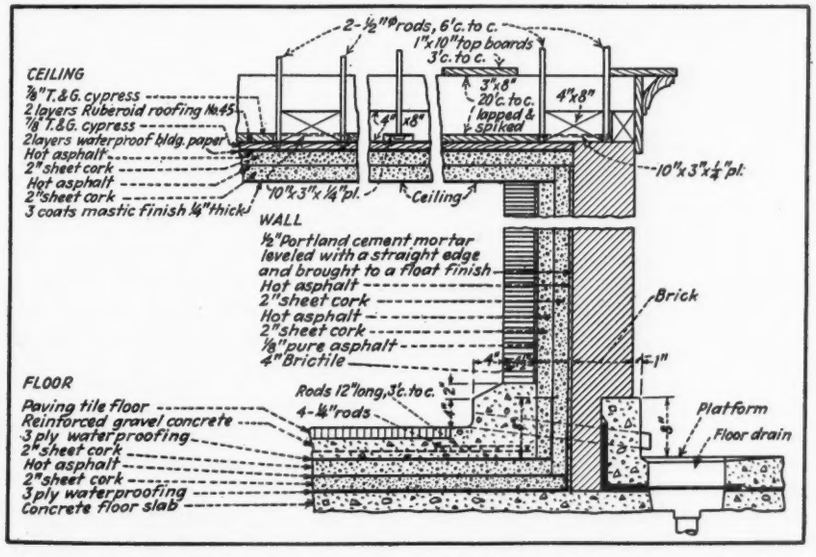


Diagram showing details of construction of chill box. The ceiling construction is something new, intended to reduce maintenance costs.

Private and general offices have conditioned air outlets built into overhead lighting fixtures.

Complete Air Conditioning Aids QUALITY CONTROL—

Betters Public Relations

Positive control over temperature and humidity of air throughout all departments in plant improves product quality, raises employee morale, aids in plant cleanliness, lowers production costs and helps to widen market.

By PAUL H. HELMS
President, Helms Olympic Bakeries, Los Angeles, Calif.

COMPLETE AIR CONDITIONING of a bakery may, on first thought, strike an industrial-minded individual as an unnecessary expenditure of money. At least the question "Why air condition a bakery" has been raised.

After two years experience with our new and fully air-conditioned plant I would make the entire investment for the improved employee relationship alone. We have the happiest baking crew I have ever seen in any one shop in my 25 years of baking experience.

In addition to this improved personal relationship we have been benefitted by such results as:

1. Uniform control over products during manufacture.
2. Increased cleanliness in plant production areas with resultant assurance that our products are clean and wholesome.
3. Correct cooling conditions for bread regardless of outside atmospheric conditions.
4. As much as 10 per cent increase in employee efficiency.

Bakers for many years have been making progress in controlling the uniformity of the various ingredients going into their products. Such progress has been for the purpose of getting uniform appearance, texture, and taste or flavor. However, all the care and precautions taken in the selection of ingredients were wasted on days when atmospheric temperature and humidity conditions changed through a wide range. For the baker had no control over air conditions.

Attempts to correct these conditions and to equalize temperature variations were first made by using fans to circulate outside air into and through the plant. The next progressive step was the use of air washers to cool and clean the air as it was drawn into the production areas. However, room conditions still varied with outside temperatures and humidities. Finally, true air conditioning in which temperature, humidity, and rate of air movement are automatically controlled at all times was found to be the real solution to the air problem in its relation to the production of uniform quality products.

In the past bakers have confined their efforts in air conditioning to the dough or fermentation rooms, the proof boxes, and bread coolers. In the building of our new plant we felt the need of regulating air conditions throughout the entire plant.

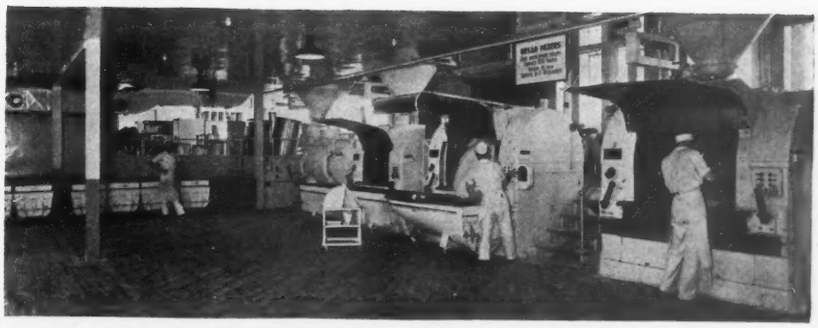
To that end a complete air-conditioning installation was made. It is a

Helms bakery is completely air conditioned.

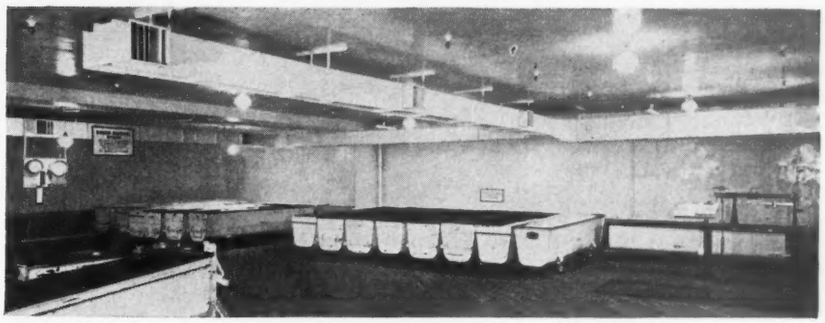
central-station installation with a York 275-ton Freon-12 watercooling, duplex condensing system. Two compressors are driven by a 250-hp. synchronous motor to give a highly flexible performance. Such a hookup permits operation at 100, 75, 50, and 25-per cent capacity to permit flexible operation with load on different parts of the system. Other units in the system are (*a*) Freon-12 water cooler, (*b*) main dehumidifier and supply of fans, (*c*) centrifugal chilled-water pumps (*d*) return sump pump, (*e*) two centrifugal condenser - water pumps, and (*f*) a forced draft spray cooling tower.

The air-conditioning system is split up to function in five separate zones:

(1) Private offices;
(2) General offices;
(3) Bakery main floor;



Conditioned air duct in mixing room runs along ceiling at rear and with nozzle outlets to distribute air into the room.



Air in fermentation room is maintained at desired temperature and humidity levels by having the distribution outlets over the middle of the room as well as along the sides.

A part of Zone 3 in the air-conditioning system is the makeup department.

▶ ***Air conditioning of single departments or processes has long been practiced in the food industries. Candy and chewing gum plants, bakeries, breweries, bottling plants, pasteurizing plants, meat packing plants and many others have improved quality, lowered costs, and bettered working conditions through controlled temperature, humidity and air circulation. But the application of "controlled atmosphere" to complete food plants is still a rarity. And its justification, as given in this article, is useful to***

All Food Engineers

(4) Bread coolers;
(5) Bakery mezzanine floor.

Booster fans, heaters, ducts, and controls are necessary for each of the zones for individual operation and control. The central dehumidifier supplies conditioned air to four of the five zones. The central water cooler supplies chilled water to the lines running to the bread coolers comprising the fifth zone.

The first two zones are air conditioned the year-around to maintain a temperature of 75 deg. F. and a relative humidity of 50-55 per cent. Private offices are zoned separately from the general offices because they have an outside exposure and are subjected to a wider variety of weather conditions. Conditioned air is introduced into all the offices through ceiling outlets fitted into the overhead lighting system.

Zone 3 comprises the main bakery floor on which are situated the receiving room, semi-perishable ingredient storage, mixing areas for the bread, cake, and pastry departments, fermentation and proofing areas, oven areas, and bread and cake loading and unloading areas—a total floor space of 97,500 sq.ft. in which correct temperature and humidity control is essential to uniform production. This area is served as one zone because year-around conditions of 80 deg. F. and

50 per cent relative humidity are desired and maintained.

The chief heat load on the air-conditioning system in this zone comes from the traveling ovens. It is so great in the summertime that exhaust fans are used to carry most of the oven heat directly to the outside of the building. In winter the exhaust fans are shut off and the oven heat is circulated to provide room heat for the entire plant. Insulated refrigerated rooms or coolers are provided in this zone for the perishable ingredients.

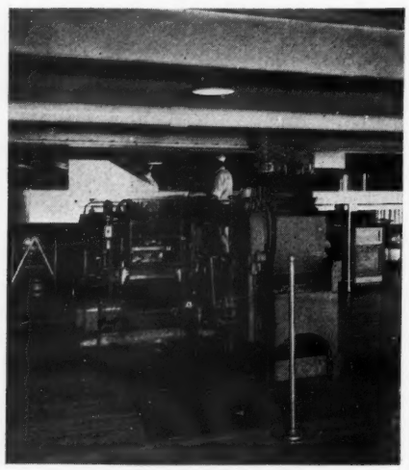
For the bread cooling zone, York Ice Machinery Corporation engineers worked out a system through which cold water from a central water cooler could be used to maintain the desired bread cooling conditions. To a large and surprising extent during past years, bread cooling has been a hit-or-miss procedure with the bread stored on racks or carried on a slow moving conveyor exposed to any existing room temperature ranging from 75 to 100 deg. F. and room air that might be laden with mold spores. A variable movement of air currents throughout such cooling areas also made uniform cooling almost impossible; highly problematic at best.

Experience has shown that bread wrapped before being correctly cooled is likely to mold. There is the additional undesirable influence of high humidity during cooling upon the character of the loaf crust and the softness of the bread.

We had previously tried to control the cooling of our bread by installing an air washer and filtering the air supplied to our cooling area. In spite of that installation and practice we found that variable outside weather conditions would often raise the humidity of the washed air to a level where undesirably soft bread resulted.

After making a case study of our cooling condition, the York engineers revamped our air washer to provide refrigeration through the use of chilled water and installed new temperature controls of slightly different design than those we had been using. Our rebuilt cooling system gives us the desired constant temperature of 75 deg. F. and relative humidity of 60 per cent, regardless of outside weather conditions and without the use of so much outside air. By cutting down on the use of outside air we keep down our refrigerating costs as well as reduce the likelihood of exposing our bread to air containing mold spores.

Zone 5, the bread wrapping department, on the bakery mezzanine floor is air conditioned for all-year control of temperature and humidity. The conditions maintained in this zone are the same as in the bread cooler to prevent any change in temperature or humidity which might affect the bread during and even after it has been wrapped. In this zone the conditioned air is supplied by overhead ducts on the side walls discharging towards the center of the area.



Air conditioning cuts costs in wrapping department by eliminating miswraps and paper waste.

In cake department the main duct runs lengthwise over the middle of the room with branch ducts leading off at right angles with nozzle outlets as in the mixing room.

By air conditioning our plant in this manner, we find that:

1. Zoning permits individual area operation and provides flexibility to meet variation in requirements under different peak conditions;

2. Use of oven heat for winter building heat cuts down considerably our need for special winter equipment;

3. Use of the synchronous compressor motor with leading power factor characteristics helps to balance the lagging power factor arising from the operation of a number of small induction motors in the bakery, an advantage for the improvement of the power factor for the entire plant in that the synchronous motor may be run without either compressor being in operation just for the purpose of balancing the lagging power factor, made possible by electric clutch connections from motor to compressors to permit the motor to operate one or both compressors or run free if necessary;

4. Complaints of moldy bread have been practically eliminated during summer months in spite of some days being very hot and humid;

5. Bake shop is easier to keep clean because dust is cleaned out of air before recirculation; even flour sifting room is free from dust;

6. Inspector making hourly trips through all parts of the shop and checking temperature and humidity conditions in all departments finds conditions ideal; even in the wrapping department, where we have five electrically heated wrapping machines which operate without paper sealing trouble, a saving in time and paper because of elimination of rewraps;

7. From a merchandising point of view our use of air conditioning is worth many thousands of dollars in customer and consumer advertising, and during the past year, 40,000 visitors have come to our Olympic bakery to observe and hear comments on the favorable features of air conditioning. Schools and colleges in Southern California are using this bakery for management and industrial studies. These pupils and students vary in age from 10 to 21 years. In addition to being certain potential customers within a few years, they are factors of immediate buying influence in their homes;

8. Our products in 1938 are selling at over $65,000 per week, a 10 per cent increase over 1937, and an increase of 20 per cent over 1936 when we did not have an air-conditioned plant, and this gain was made with less purchased advertising than in any one of the five previous years.

How to Select and Maintain SANITARY FLOORS*

By
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and
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SANITARY FLOORS that are durable and suitable for any food processing plant are not necessarily expensive, nor do they require radical design or installation. In general, the most important part of this problem is the selection of some suitable material plus a careful workmanlike installation.

From a critical viewpoint, the suitable types of floors should have the following characteristics: (1) a continuous smooth surface, (2) imperviousness to water or other materials used in plant (soaker solution, acidified syrups, carbonated water, etc.), (3) ready ease of cleaning, (4) ability to withstand loads and traffic.

The continuous smooth surface on a floor is necessary to maintain cleanliness, for unless the surface is free from roughness or cracks it will be impossible to keep foreign substances from accumulating and causing a nuisance, either locally on the floor or as a general breeding place for spoilage organisms.

The imperviousness of the floor to the liquids or substances likely to fall on it during the normal operation of the plant is an obvious necessity, for pitting, scarring or staining will soon ruin the desired surface.

The ease of cleaning the floors is not only dependent on the smoothness of the floor in determining the amount of work necessary to remove soil, but also on the arrangement of the drainage systems so that when the floors are wet they will naturally tend to drain free, not collect puddles, and be so arranged that they adequately carry refuse and wash water from the floor. There are few parts, even of storage areas, in any food processing plant that do not need to be washed down thoroughly at regular intervals as a good housekeeping measure.

ALL FLOORS are subjected to traffic of one type or another, and those parts which are subjected to heavy loads, either stationary or on wheel trucks, should not mar or break up or become hazardous nuisances.

Wood floors are easy to construct and are generally inexpensive. Wood flooring does not resist continuous wetting, does tend to become rough and porous when used in wet areas, and will splinter, warp or crack when used in dry areas if there is much traffic over it. To overcome these latter difficulties, smaller sections of wood can be laid in several ways to give better wearing surfaces. Maple flooring has been laid very successfully in small sections or squares, using a mastic bond, which gives a hard, dust- and splinter-free surface, non-skid in character, that will stand up under traffic, provided it is kept reasonably dry at all times. Likewise, wood blocks laid end grain up will withstand much heavy wear, although they do not give as smooth a surface. In general, these are best adapted to storage spaces or other processing areas which are reasonably dry.

Concrete floors are usually found to combine a maximum utility with reasonable cost. The entire success of such a floor is intimately connected with the method of laying the floor, and *particularly the finishing of the surface,* for after all the surface carries the wear, while the base slab carries the load.

In preparation of either the base slab or the finish coat mixes, several important factors must be considered. First, all aggregate used (sand, gravel, etc.) must be clean and of the size specified. Second, the correct amounts of cement must be used. Third, no more water must be used than that specified, for wet, easy flowing mixes will give weaker concrete than the stiffer mix; if the aggregate used is wet, a reduction in the water added to the mix if necessary. Fourth, the batch must be mixed for not less than 1½ minutes, and longer if possible. Then, after pouring, the surface of the concrete must be kept wet, either with wet burlap or by flooding, using small dikes; this wet cure should continue for at least seven days. Short cutting or negligence in any if these steps will result in inferior, weak concrete.

The base slab is usually at least 4 in. in thickness and is made with fairly large aggregate. A typical mix is 2 cu. ft. of sand, 3 cu. ft. of rock (not over 1½ in.), with not over 6 in. of water per sack of cement. The consistency of the mix is made just fluid enough to be readily tamped into the type of forms used. Proper reinforcing rods for the design should be placed as needed. It is important to strike off the base quite accurately to at least 1 in. below the level of the finished floor, eliminating all "puddles" or low spots. Over this comes the finish coat, and it may be applied either after the base has cured at least ten days or, if the time is important, the so-called monolithic procedure is suggested, in which the finish layer must follow the base slab not more than 45 minutes after the base is placed.

FINISH MIX requires a careful selection of aggregate, for the strength of this surface is in the aggregate. It is made of one part portland cement, by volume, one part clean sand (size between 50 and 100 mesh), and two parts coarse clean gravel or rock aggregate (size between ⅜ and ⅛ in.), mixed with not over 5 gal. of water per sack of cement for a period of at least 1½ minutes. This is a stiff mix and must not be made fluid by adding extra water or a poor finish will result. This should be tamped or rolled, brought to grade with a wooden float, and the level checked with a straightedge.

Before going on to the next types of materials, it should be mentioned that the care used in placing the concrete base slab applies to most of the following types of floors, since they are nor-

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* Based on a paper given by the authors at the convention of American Bottlers of Carbonated Beverages, New York, N. Y., Oct. 31, 1938.

Administration of the New Federal Food, Drug and Cosmetic Law*

By WALTER G. CAMPBELL
Chief of Food and Drug Administration
Washington, D. C.

A DISCUSSION of the task of administering the Food, Drug, and Cosmetic Act does not require necessarily an analysis of the law, but no adequate portrayal of the enforcement picture can be made without proper consideration of those provisions from which the principal administrative problems spring. Even the most superficial comparison of the measure with the Act of 1906 discloses pronounced differences in character and substance.

The new law exceeds the scope of the old by including devices and cosmetics. It authorizes restraint of violations by injunction. It has materially broadened the definitions of adulteration and misbranding. The burden of proving fraud in actions against drug preparations bearing therapeutic claims has been removed. The opportunity for that type of evasion provided by a distinctive trade name no longer exists. Power to formulate legal standards of both identity and quality for food products has been conferred. New drugs no longer may be marketed without regard for the consequences of their use, and those which are dangerous to health when used as the labeling directs can't be marketed at all. And in emergencies extraordinary power may be exercised to prevent interstate traffic in contaminated food.

To enforce a law characterized by these and other important new features necessitates appropriate modification of the administrative machinery. Organization evolution and transformation must occur to meet the added obligations imposed. These for the most part will be modeled on the existing pattern. Out of the far-flung reaches of the three inspection districts into which the country is divided, a fourth should be created. This will permit more immediate supervision. That in turn will expedite operations and promote efficiency.

Whether new subject matter divisions should and can be provided for cosmetics and devices or whether an extension of regulation to these products, can be undertaken as an incident to the work of existing divisions, cannot now be determined. Admittedly we know little about cosmetics. Our interest in them in the past has been restricted to such preparations as were included in the statutory definition of drug. We have, through the helpful attitude of the industry, acquired some recent information about the volume of production, and variety and composition of articles produced. However, our present knowledge will not permit a measurable anticipation of the administrative problems which may arise from this source, their frequency or complexity; nor the difficulty of their solution. Our exploratory studies in this field are well under way. Their completion will determine what additions to the organization chart are desirable. But in this, as in all other such matters, Congress will determine what is possible. The final answer will be found in the figures of the appropriation act. No legislative mandate can be given effective expression without provision of adequate facilities for that purpose, and then only when directional disposition of them occurs through studiously determined organization plans and intelligent deployment.

But what of the administrative position formulated through departmental interpretation of the statute? What effect will transition from the old law, with its simple definitions of offenses, to the new, with its more numerous and more complex provisions, have on the administrative gage by which compliance or noncompliance is measured?

CERTAINLY the many-angled considerations to which food, drugs, and cosmetics will be subjected under the multiplied requirements of the definitive section of the new law will impose a materially broadened administrative viewpoint. The respects in which this change will manifest itself are definitely and clearly indicated in the Act. The evidence provided by appropriate examination of every article of food must, in addition to the appraisal which it now receives, be carefully weighed to determine whether the article contains a natural or normal poisonous ingredient in sufficient quantity to render it injurious to health; or whether it contains added poisons in excess of the amounts established by regulation to be unsafe. Increased significance will be attached to the practice of adding color to food, not alone for the reason that it may conceal inferiority but because it may also make the product appear better or of greater value than it really is. Labels must be scrutinized to learn whether proper declaration of all food ingredients has been made.

A drug purporting to be one recognized in the official compendium but at variance with its standard of strength, quality and purity, must be noted, not for the purpose of ascertaining as at present whether its own standard is indicated on the label but whether the difference between it and the official product is accurately and plainly set forth. Labels of all drug products will be carefully viewed in the light of new requirements that they bear a declaration of the quantity of contents; that they bear a quantitative declaration of the ingredients which may render them habit-forming and a definite warning to this effect; that the active ingredients of non-official preparations be listed; that adequate directions for use be given, and also warning to children and others whose pathological conditions is such that consumption of the drug might be dangerous to health. Special consideration must be given to deteriorating drugs, the extent of which will depend upon the character of the drug and the terms of the regulation to be promulgated concerning such products.

Besides these special features there are several important requirements common alike to food, drugs, and cosmetics which broaden very materially the basis for administrative judgment. The observance of appropriate standards of sanitation will become compulsory. In the past the task of combatting unclean premises has devolved entirely upon state and municipal officials. Federal interference could occur only when the condition was so insanitary that the food output became demonstrably filthy. While this provision of the new law cannot be said to be a sanitary measure in the sense that it could supplant local legislation of that character, it will undoubtedly prove itself invaluable as a support to the states in their insistence upon proper precaution against contamination in the production and sale of all products.

Interest will not, as at present, be restricted to merchandise alone, but will extend to the container in which it is packed and sold. The use of containers composed wholly or partially of poisonous substances which would deleteriously affect the food content, has been too frequently an objectionable practice against which we could only inveigh. No action could be taken in arrest of a development which would eventually render the food a threat to the health of consumers. A charge of adulteration could not be maintained until the food had absorbed the poisonous substance in an amount which might render it injurious to health. In the future remedial measure may be inaugurated in anticipation of this development by establishing the potentiality of the container for production of the prohibited contamination. Not only poisonous but dishonest containers will be outlawed. In prohibiting the use of those which are so formed or filled as to deceive, Congress has finally enacted the "slack-pack" measure which it has frequently considered and which passed the House on three occasions.

There is no portion of the Food, Drug and Cosmetic Act which will exercise a more profound influence in revising the present administrative viewpoint than the statutory definition of misbranding. A food or drug is now deemed to be misbranded if its labeling is false or misleading in any particular. A very com-

* Read before 42d Annual Conference of the Association of Dairy, Food and Drug Officials of the United States at Chicago, Ill., Oct. 18–21, 1938.

prehensive and satisfactory exposition of the significance of that language is to be found in the unanimous Supreme Court decision, *U. S. v. 95 Barrels of Vinegar (265 U. S. 438)*. In charting the course which executive functioning should follow, this judicial expression established unequivocally the importance of the implications of language. It said that deception might result from statements literally true, and that the aim of the statute was to prevent the use of false labels not only, but those which through implication or ambiguity would deceive or mislead purchasers. Sweeping as this decision was in providing exceptionally wide latitude for administrative appraisal of label statement, it did not and, in the light of the statute itself it could not authorize that account be taken of things unsaid. In consequence all risk of offending could be eliminated by having the label say little or nothing. Extravagant representations were transferred from label to advertising. Too frequently labels failed to contain sufficient information to permit intelligent or discriminating buying. The statute enjoins truth but, so scant are its affirmative requirements about telling the whole truth, that it soon became recognized as a negative law.

Not so with the recent enactment. Under it a product may be misbranded on what the label forgot to say, as well as on the incorrectness of what it did say. After June, next year, administrative officials, in considering labeling representations, will be required to take into account the extent to which there is a failure to reveal facts material in the light of what is asserted, or material with respect to consequences which may result from the use of the article. Obviously the keynote to the broadened administrative interpretation which this provision of the Act entails is the word "material." The features encompassed by this term in the vast category of foods, drugs, and cosmetics of all varieties are so numerous as to defy classification. Rather than attempt to catalogue them on other than an illustrative basis, the question, it may be said, is one which will remain for determination on the facts as presented in individual instances. Differences of opinion with the industry will in many cases occur. Disputes will arise which can be settled with finality only by litigation. Out of this, apparently, will grow a situation which will afford to manufacturers an opportunity to demonstrate the value of the Declaratory Judgment Act.

AMONG the provisions which contribute to the definition of the administrative position some became effective upon approval of the Act. Under the section proscribing the marketing of cosmetics containing poisonous substances likely to render them injurious to health, 61 court actions have to date been instituted. These, for the most part, involve articles containing paraphenylene diamine which have a history of personal damage from past use. In every instance the potentiality of the article for injury was confirmed by animal experimentation. Under the dangerous drug and new drug sections an equal or greater volume of work has been done, although this is not reflected by a comparable schedule of litigation. The number of deaths and cases of blindness authentically reported from the administration or the consumption of dinitrophenol, dinitrocresol and related chemicals and the striking unanimity of expert opinion, so far as our census disclosed, that their consumption under any form of directions contemplating effective use would be dangerous, prompted the Administration to issue instructions for a general survey, with the object of instituting appropriate action against drugs which contained these ingredients. Obviously, the publicized disfavor with which such products have been regarded by the Administration in the past has had its effect. Apparently production and interstate shipment of them ceased with the approval of the new law. Our survey located no stocks which were received subsequent to June 25 of this year.

Announcements have been issued on sulfanilamide, cinchophen and aminopyrine. These indicate that for the present our operations will be restricted to action against those products, or drugs containing them, when found in interstate commerce under labeling which may result in their use by the general public. In saying this the Administration is well aware of the futility of label legends such as "For use only under doctor's directions" in preventing promiscuous sales and wide-spread public consumption. Actually, there is persuasive evidence of an understanding that this and similar precautionary statements serve to popularize the preparation bearing them. Such ineffectual warnings may not, under our conception of the law, operate as a disavowal of responsibility. The statutory prohibition is directed at drugs which are dangerous to health when used in the dosage, or with the frequency or duration prescribed, recommended, or suggested in the labeling thereof. When there is abundant proof, that the character of a drug is such that irreparable harm will attend its inexpert use even though dosage directions be meticulously observed, enforcement agencies have no alternative to the requirement that sales and distribution be so controlled as to make it unavailable to the public. That is what these announcements in effect say. On those drugs where our continuing survey of clinical data justifies it, a more advanced administrative stand will be taken—one similar to that on dinitrophenol. This means neither the existence of a purpose to construe the Food, Drug, and Cosmetic Act as a statute for the regulation of the legitimate practice of medicine, nor a denial of the fact that in imposing restrictions on the production and sale of drugs that law as well as the Act of 1906 definitely impinge on that field.

The section on new drugs is the most novel portion of the statute. Unpremeditated in the sense that it did not appear in earlier editions of the legislative test, it was, as is well known, offered as a preventive rather than a penal means for avoiding repetition of disasters like that caused by Elixir Sulphanilamide. In prohibiting the marketing of a new drug until an application filed with the Secretary becomes effective, the statute does not provide for administrative determination on any feature except safety for use under the labeling directions employed. The advance regulations have outlined the respects in which a product may become a new drug. These range from outright innovations—the employment for drug purposes of products which had never been so used before—to change in proportion of ingredients, or change in excipients of drug preparations which, under the original formulae, have had a recognized use since time immemorial.

BECAUSE the statutory definition of new drug is postulated on its safety for use, and because its power for harm is ordinarily derived from its potent drug principle, the question has no doubt arisen about the wisdom or the right of the Department to attach so much importance to the menstruum. But it seems to me the answer to this query is promptly suggested when we recall that the most spectacular catastrophe in the realm of drug administration in modern times was caused not by the active drug ingredient but by the solvent with which a so-called elixir of it was prepared.

The administrative stand in ascribing such comprehensive meaning to the term as that indicated in the regulations has received rather general support, in recognition doubtless of the accuracy with which it reflects the known legislative intent.

Many applications have been submitted, and they continue to arrive in increasing number. These for the most part relate to products which do not require prolonged consideration. Such slight delays as may have been occasioned by the newness of the task and the necessary organization of ourselves for its proper handling should not henceforth be experienced where the preparation is one about which a prompt decision can be reached. But with articles of a different character there is a purpose to be thoroughly deliberate—deliberate to the point of a complete consideration of all supporting data by and with qualified experts to whom we will appeal for that purpose.

Comparatively slight significance may be attached to the viewpoint of an executive officer where the statute clearly and exactly defines offenses and indicates with precision the procedure to be followed in suppressing them. It is otherwise, though, where the legislative expression is dependent upon administrative findings for its consummation.

The Act of 1906 made no provision for an executive exercise of quasi-legislative or -judicial functions. It authorized the three Secretaries to issue administrative regulations, but the Congress withheld the power to promulgate from time to time special regulations by which the general provisions of the statute could be specifically applied. Even at that time the difficulty of effective regulation of traffic in food in the absence of legal food standards was recognized. The House version of the bill provided for such standards through administrative operations, but that feature was eliminated upon insistence of the Senate which had opposed an extension of this authority, and for more than 30 years consumers and manufacturers alike have been confronted with a condition which has operated to their detriment. Through amendments to the old law, like those relating to net weight and the establishment of a standard of quality for canned food, the administrative position has changed somewhat. But even now it is in no way comparable to that which will prevail after June 25, 1939.

As illustrative of this difference, the new law authorizes the Secretary by regulation in fourteen different instances to provide exemption from its provisions. Such authorization occurs only once in the present Act. The new law also empowers the Secretary by regulation to set a limit on added poisonous and deleterious substances in food; to promulgate standards of identity and a standard of quality; to specify the labeling for special dietary foods; to resort in emergencies to control by permit; to list and certify coal-tar dyes; to prescribe tests and methods of assay for Pharmacopoeial drugs; to designate derivatives of listed habit-forming drugs on which also the warning legend must appear; and to provide a form of labeling and packaging for

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New PACKAGES AND PRODUCTS

Consumer Demand Exerts Pressure

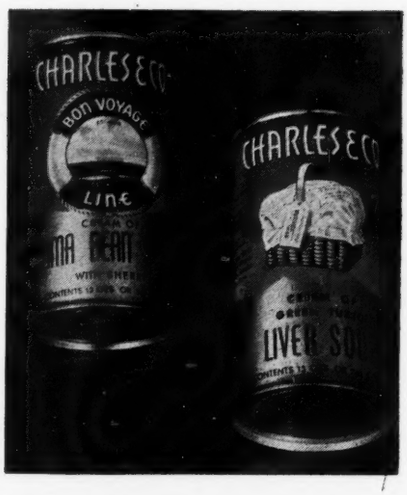
ENCLOSURES in each loaf of Pepperidge Farm bread recently announced grist-mill ground, whole wheat flour, new product of Pepperidge Farm, Fairfield, Conn. (FOOD INDUSTRIES, Nov. 1938, pp. 630–31). Within four days requests for the product by consumers brought unsolicited orders from retailers for the whole wheat flour. This whole wheat flour is packaged only in small bags to insure use of the product before germ oil can become rancid and cause off-flavor. Retailers' stocks are limited in order that only fresh ground flour is in stock or on their shelves. The spontaneous response to the announcement of the new flour indicates the interest consumers have in whole wheat flour. It also indicates that a product with a reputation for quality builds acceptance for additional products of the same manufacturer.

Sky Bars Make First Landing

A "MULTIPLE CENTER BAR" manufactured by the New England Confectionery Co., Cambridge, Mass., has recently made its appearance in retail stores under the trade name, "Sky Bar." This new addition to the Necco lines of 5-cent candy bars has four different centers including English toffee, honey nougat, nut butter toffee and fudge parfait, all molded into one bar by a chocolate covering. Each bar is packaged in a brightly colored, lacquer finished paper wrap. Skywriting was one of the merchandising methods used to introduce the Sky Bar.

Cream Soups with Wine

TWO NEW CREAM SOUPS, products of Charles & Co., New York, N. Y., give further evidence of the trend toward more ready-to-serve dishes made to ease the housewife's drudgery in preparing foods. These soups, a cream of green turtle liver soup and lima bean soup, in gayly lithographed, 13 oz. cans, are both seasoned with sherry wine.



The Package Must Talk

By IVAN C. MILLER
Distribution Editor, Food Industries

RECENT YEARS have witnessed many innovations in food manufacturing, many changes in food distribution. These changes have been forward; they reflect progress. The quality of food products has been raised. The life of many perishable products has been greatly extended. Spoilage of food caused by bacteria and mold has been reduced and food sanitation improved. The trend of over-all cost is down. Much of this progress can be credited to the manufacturers of package materials and packaging machinery. Packaging is on the upward trend.

MOST INDUSTRIES are limited, or unlimited, only by general conditions, by the volume of sales pressure or by the fluctuations of personal desires—inherent or created. The food industries are limited by an unyielding control: per capita consumption.

As a nation, we may spend for automobiles and economize on clothing, or travel and see no shows. But we eat relatively the same amount of food year after year. To be sure, we spend more or less, for what we eat, but the quantity remains the same. The food industries cannot expand in volume at the expense of the automotive industry, the radio industry or the railroads. The only important fluctuations are within the industry.

In general, the competition the food industries give and receive, from other industries, is less than the competition those industries give each other. That does not mean, however, that the competition within the food industries is not intense—intense because no one food industry gains unless one or more other food industries lose.

According to the United States Department of Commerce, between 1899 and 1931 the per capita consumption of cereals declined approximately 40 per cent, sugar consumption increased 61 per cent. Although in 1931 we consumed 23 per cent more animal fats and oils than we did in 1899, our consumption of vegetable oil increased during that same time by 500 per cent, while fresh fruit consumption increased 13 per cent; canned fruit consumption, 360 per cent; fresh vegetable consumption, 27 per cent; canned vegetable consumption, 175 per cent. In less than twenty years vegetable acreage has increased more than threefold.

JUST IN THE LAST 30 YEARS, from 1906 to 1936, the Department of Agriculture's per capita figures indicate a decrease in the consumption of meat of 27½ lb. per person, a loss of approximately 18 per cent, while only since 1920 and up to 1936 the figures of the Bureau of Agricultural Economics indicate a per capita increase of 12 per cent for butter, 28½ per cent for cheese, and 85 per cent for condensed and evaporated milk.

Does it not appear from the foregoing that foods sold in the bulk or with the minimum amount of consumer packaging are being replaced in acceptance by those offered to the consumer in attractive and convenient packages?

The influence of consumer acceptance of packaged foods is not limited to changing the ratios of per capita consumption of various foods. The influence is obvious in both the distribution and production of foods. During the six years from 1929 to 1935—these are the only years for which we have government retail distribution figures—21 per cent of the meat markets passed away. What is worse, meat market sales were but 46 per cent of 1929. (Only a small portion of meat market products are packaged.) Though sales were off, the number of grocery stores without meat changed little. Combination stores, however, selling packaged groceries and meats, increased 44 per cent in number and also increased 6½ per cent in sales volume. Combination stores in 1935 accounted for approximately 60 per cent of the total sales of the three groups.

These figures, now almost three years old, are cold, they have jelled. The last three years have witnessed the expansion of the *big* combination store, the supermarket, and with it has come the adaption of self-service generally.

Last year in one of these new self-service stores 33 brands of coffee competed against each other, 47 different packages of tea bid for a place in every market basket. No clerk sponsored any of the brands of coffee nor recommended any of the teas. In fact, no clerk aid was given to any of the 6,000 and more packaged grocery products in that self-service market. But that market sold, the day it opened, $55,000 worth of groceries. In one day, sales exceeded the *annual* sales of the average grocery chain store. The number of these self-service stores, large and small, is variously estimated between 3,000 and 6,000 and the average yearly sales of each exceeds the sales of 200 of the average corner groceries, exceeeds the sales of ten average chain units. But none of the packaged products that flow in such large volume through the self-service market are sold. If they get into the market basket they sell themselves. What a responsibility to place upon the package. The self-service store is no place for a shrinking violet. The successful package in the self-service store must talk.

THE SUPERMARKET is a package store. But will the supermarket remain, will it grow and expand as an instrument of distribution—the supermarket, the package store, which itself packages bulk dried fruits, peas, beans, candy, coconut, etc., in transparent cellulose bags and, through its mass displays, increases sales of these products 1,000 per cent, at a price which more than covers the cost of the package? Will the supermarket multiply and command an increasing portion of retail sales?

When the self-service stores, especially the pine-board, abandoned warehouse type of supermarkets, stuck their ugly heads up out of the mire of the depression, they were given but a short time to live. The judges who pronounced judgment on them were their competitors, other retailers, and manufacturers whose products they did *not* sell, or whose products they *did* sell at prices too near cost

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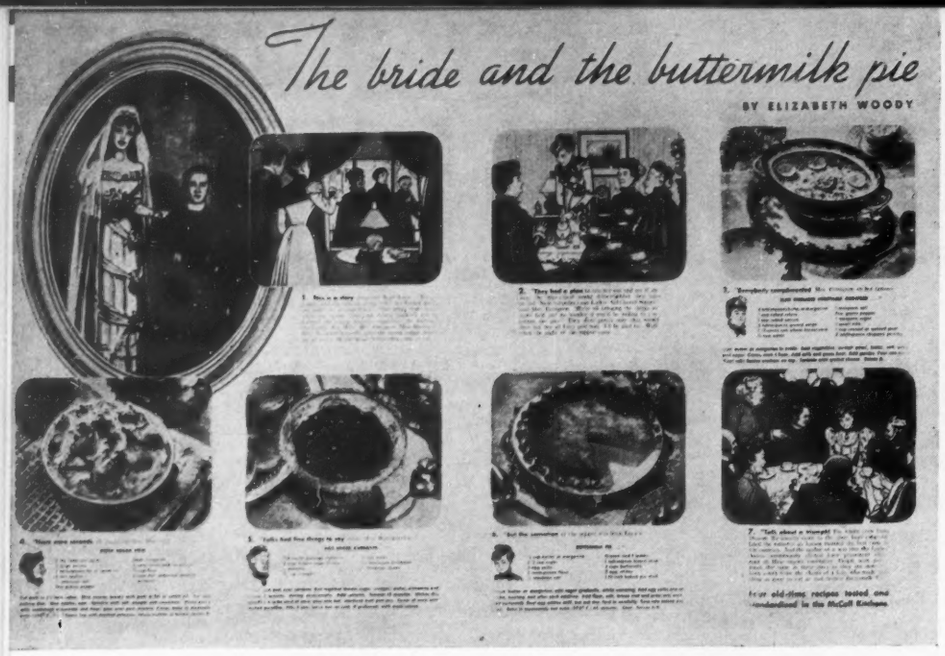


McCall's features these food pages in January

January food pages for

These Food Pages Will Stimulate YEAR END SALES

Manufacturers whose products appear in one of the women's magazines can increase holiday season sales by using illustrated posters bearing mounted reprints

IF YOUR PRODUCT is featured in the January issue of one of the women's magazines (advance proofs reproduced on these pages), posters bearing reprints of the page illustrating your product, used as the center of an "impulse sales" display in retail outlets, will materially increase purchases of your product in those outlets.

Results obtained from tests made with the cooperation of both independent and group retail organizations have been reported in earlier issues of FOOD INDUSTRIES. These tests have proved two facts: Retailers generally welcome this type of poster more than other types; and cooperate in giving it an opportunity to produce. This type of poster, made by mounting reprints of the illustrated food pages of the women's magazines, produced pronounced increases when used to stimulate sales.

As a result of these tests FOOD INDUSTRIES arranged with the women's magazines to obtain advanced proofs of these pages. The purpose of obtaining these advanced proofs is to describe and illustrate the forthcoming food pages of the women's magazines so that the manufacturers whose product or products are among those featured may obtain ready-for-use posters bearing reprints of the food pages and place them in the hands of the retailers on or about the same time the magazines reach their readers.

Mounted reprints of these food pages (single pages on 14x22 in. poster board, spreads on 28x22 in. poster board) may be obtained from the magazine ready for use at the following prices:

SINGLE PAGE

1,000 to 1,999 inclusive	15¢
2,000 to 2,999 inclusive	12¢
3,000 and over	10¢

TWO-PAGE SPREAD

1,000 to 1,999 inclusive	25¢
2,000 to 2,999 inclusive	18¢
3,000 and over	16¢

Manufacturers may either correspond with any one of the magazines direct, if interested in food pages appropriate for their products, or write to the distribution editor of FOOD INDUSTRIES.

Each poster will carry the printed line "As seen in the January issue of ..... Magazine". The manufacturer's own selection of caption or "selling slug" such as "Try these recipes suggested by *Good Housekeeping*," "Holiday Hits," "The Bride and the Buttermilk Pie," "Through the Looking Glass," etc., will be printed at the top of the poster. No poster will bear the name of the manufacturer or his trade brand.

Woman's Home Companion

These Food Pages Will Stimulate New Year's Sales

GOOD HOUSEKEEPING: Full-color page which may be used for promotion of smoked ham and fruits.

LADIES' HOME JOURNAL: Full-color spread suitable for promoting sale of cake-making ingredients, ice cream, gelatin, and canned tongue, veal and ham.

McCALL'S: Two-color spread to promote sale of frozen or canned vegetables, currants, spices and other ingredients for pie making.

PICTORIAL REVIEW-DELINEATOR: Four-color spread with recipes for appetizers to be made from cheese, mayonnaise, and gelatin, and baked products to be made from dried and candied fruits and nuts.

WOMAN'S HOME COMPANION: Two-color meat and vegetable pie spread suitable for promoting sale of canned yams, macaroni, deviled ham and sausage.

Upper: Pictorial Review-Delineator four-color spread for January
Lower: January food feature in Good Housekeeping

Food pages from January issue of Ladies' Home Journal

or below. The press passed judgment too, because the press saw in the supermarket movement a threat to advertising revenue from voluntary and corporate chains. It is not difficult to remember what was said—"Just a depression orphan, supported by the unfortunates crushed by adversity." "With the least betterment of conditions, people will refuse to travel the long distances to the supermarket." "After all, women do not like to wait on themselves." "Soon, when times are a little better, all supermarket customers will return to the friendly service of the corner grocer,"—and higher prices. But they didn't.

When the judges passed judgment on the early supers, Mrs. Consumer's opinion was not asked. Mrs. Consumer has found something she has long wanted and you may be sure she is going to keep it. She likes the lowered prices of the supermarket, but that isn't all she likes. She likes the crowds, the freedom to roam, to shop, she likes to serve herself. She likes the variety—yes, the much greater variety—she likes the mass displays. Inconsistent woman that she is, she likes to be sold, not by suggesting, substituting clerks, but by an inviting alluring package.

THE SELF-SERVICE STORE *is* here to stay. The supermarket, the colossal store, has no corner on this method of selling. Self-service is coming into the neighborhood, into the corner grocery. There are reasons which account for the present consumer acceptance which shapes this trend.

Manufacturing with its technical developments, its mass production and labor-saving machines, has consistently reduced the cost of manufacturing, even in the face of ever-rising per hour labor costs. The self-service store is distribution's production line, one of distribution's labor-saving machines. It is one of distribution's answers to John Q. Public's ancient numblings and to Mrs. Consumer's insistent demands to lower the cost of living. The end of this movement has not yet been reached. This type of retailing is in a state of flux.

The cost of selling packaged groceries is less than the cost of selling unpackaged perishables. This is selling cost alone and does not include the loss from shrinkage and spoilage. According to various studies of the cost of selling in retail food outlets, the cost of selling meat is 30 to 35 per cent more than the cost of selling packaged grocery products. This checks with the 1935 Census of Distribution, which reported a 37½ per cent higher operating cost for meat markets than for packaged grocery stores selling no meats—37½ per cent higher, even though the sales of the average meat market were one-third more than the sales of the average grocery store without meat. This additional selling cost must, of course, be paid for by the consumer in the price of meat, which price must also cover the losses from shrinkage and spoilage. Here is a major problem which food distribution faces today, the solution of which depends, in no small amount, on packaging.

Packaging has had an effect on retailing. It is also having an effect on manufacturing. The necessity of holding fish, a highly perishable food, off the market, in times of heavy production and threatened gluts, gave birth to quick-frozen fish, and at the same time, sounded a knell for the round fish dealers. Quick-frozen fish soon entered the market as a packaged item. Just during the years between 1929 and 1936, the volume of packaged frozen fish has increased 315 per cent. The expansion of retail sales of quick-frozen fish has been limited by the refrigerating equipment available to keep it frozen. It is none the less important as a packaged product because it has proved the demand for packaged fish and opened a market for packaged fresh fish which in 1936 was approximately equal to the market for quick-frozen fish.

Seafood production has increased considerably in recent years. Correspondingly, per capita consumption has increased. Between 1927 and 1935 total fisheries catch increased 26 per cent. Between 1927 and 1937 canned fish production increased 56 per cent. Just during the last six years for which there are Bureau of Fishery reports, packaged fresh and frozen fish increased 45 per cent.

FROM THE GROSS WEIGHT of catch and weight of packaged products, it is difficult to determine the proportion of fish sold packaged and unpackaged. The catch in 1935 was slightly over four billion pounds including, of course, the weight of shellfish, and the portions of the catch landed in a condition suitable only for fertilizer or byproducts. The packaged fish production the same year was but little below one billion pounds. Much of the fish catch dresses out at the ratio of approximately 1 to 3. It would appear that not only does a relatively large portion of seafood products reach the market packaged, but also that the proportion is increasing.

In the past, whatever competition there was between fish and meat, was not at the same point of sale. Fish was sold to but a limited extent in outlets where meat was sold. Now, however, both fresh and frozen fish, packaged, compete in the same outlets with meat, often side by side, in the same or adjacent case. Whatever future competition develops between meat and fish will develop largely as a result of packaging.

The development of quick-frozen fish was followed by an adaptation of fish-freezing to the freezing of fruits, vegetables, meat and fowl. The industry is young. It has been built on quality. It has caught popular fancy, to no small extent because frozen foods are packaged grocery items. To the consumer, the package is the symbol of, and a fair guarantee of, uniform quality, stable quality, unvarying quality.

The expansion of frozen foods has been held below demand, because of limited distribution facilities. There can, however, be no denying the growth of the frozen food industry, nor the excellent quality of product which can be obtained. Neither is there any doubt that frozen foods have made many converts of con-

(*Turn to page 714*)

No clerk pushes your package in the self-service super. It must do its own talking.

Merchandising
HINTS AND HURDLES

Selling Problem Recognized

OKLAHOMA A.&M. COLLEGE, Stillwater, Okla., recognizing a need which has long existed in the food industries, has set up a new four-year curriculum for training food plant engineers. The completion of this course leads to a degree of Bachelor of Science in Food Engineering. In addition to engineering subjects, the curriculum will include packaging, merchandising and accounting. Other colleges will probably include these courses in their curriculum. This is encouraging. Better food products, more saleable food products will result when production has more understanding of the consumer and selling problems.

Surplus Creates Surplus

THE CHAINS have been quite vocal in admitting their aid to farmers in moving surplus crops. No less vocal are the independents in proclaiming their share of the credit for rescuing the farmer from losses due to the abundance of nature. Our capacity as a nation to consume, for all products except food, is as elastic as our income and our ability to go into debt. Our capacity to consume food varies over a very narrow range of per capita consumption (a demonstrated variation of not over 5 per cent by volume). As distributors and consumers, we rescue one over-produced crop of farm or fishery and plunge one or more other crops into over-production —and we take a lot of credit for our accomplishment.

Isn't It True for Canners in General?

A HEALTHY CROP in 1938, on top of a record carryover of canned staples from the 1937 pack; a consumption rate somewhat less than normal; and pressure from banks on California fruit packers, most of which are heavily in debt, furnish a combination that apparently eliminates any possibility of profit this fiscal year for the principal units in the industry.

Pressure of banks on canners to place their house in order makes it necessary for canners to acquire funds. This, in turn, requires the movement of inventory off shelves and to do this prices were lowered. Following the price reductions, sales increased noticeably but it is believed current selling prices are at cost if not below.

The hope now is that inventory will be reduced to such an extent over the next three months that packing companies will enter 1939 in a greatly improved position. Sales during the remainder of the year, therefore, seem to dictate the profit outlook in 1939.

Meanwhile, California packers are discussing a memorandum issued to the industry early in October by Harrison S. Robinson, managing director of the Canners' Industry Board, San Francisco. Mr. Robinson diagnoses the ailments of Golden State canners as springing from the following causes: (1) The tonnage of raw fruit which ripens in the orchards exceeds consumption capacity; (2) The combined production capacity of canneries is too great for current demands; (3) Canned pineapple and grapefruit and canned fruit juices, now sold in huge volume, are new competition; (4) So are the recently extended markets of fresh fruits and the new marketing of frozen fruits; (5) Australian peaches, pears, and apricots, tariff preferred competitors in the United Kingdom, are produced in constantly increasing volume and are becoming almost a menace in the British market; (6) The industry as a whole has never merchandised its output.

The problem of a *constant surplus* and an annual *peak of production,* inevitable in the canning of fresh fruits, requires a special technic of merchandising which does not appear to have been put into practice by more than a few canners, he believes. Mr. Robinson points out that: "The number of individual buyers of California canned fruits has been materially reduced over the last decade by the advent of the chain stores and of the group-buying organizations of so-called independent grocers, and by the development of the supermarket. All of these new devices in the distributing system materially increase the power, the skill, and the effectiveness of the distributor's buying operations.

"Concurrently with the decrease in the number of buying units, and the great increase in their bargaining powers, the number of canner selling units has increased from less than 30 to at least 60, and where street brokers supplement the selling organizations of the canning company there may be a half dozen or more selling outlets for a single canning company, and the bargaining powers of all these selling units has declined."

If there were no more than five or six selling outlets for the canners of California, instead of more than 60, canned goods would have a better chance of being "merchandised" instead of being "for sale" under conditions of either constant or intermittent chaos, Mr. Robinson believes. He also observes that: "Canned fruits, if they are to compete successfully with pineapple and the citrus fruits, and with the canned juices, must have the benefit of sales promotion and advertising. But sales promotion and advertising are of little lasting value unless the article promoted and advertised is meritorious. Some important parts of the California pack can be improved in quality and uniformity.

"The advertising of an article bearing a 'general' name (such as flour, pineapple, automobiles) is ineffective as compared with advertising the 'specific' (Gold Medal, Dole, Buick). The principle applies to California canned fruits. Sixty selling outlets cannot successfully promote sales by brands; five or six could."

Mr. Robinson recommends that: (1) Growers of fruits handle their sales to canners through a very limited number of highly competent cooperative selling agencies; (2) Canners merchandise their canned goods through a small number of very efficient selling outlets; (3) The canning industry should be set up to sell its products not over a few weeks, but over many months of each year. The canners' selling representatives must be salesmen, not order takers. The canners must have enough working capital to carry stocks for as long as, but no longer than, sound merchandising dictates; (4) California's

canned products must have the benefit of constant and regularly continued programs of sales promotion and advertising, in connection with which selling by brands should be emphaszied; (5) Because the welfare of California agriculture is vitally affected by the sound and successful operation of the canners of its raw products, the canners as well as the growers should be permitted a reasonable degree of collective action, always appropriately policed for the protection of the consumer; (6) The permanent policy of both growers and canners should be to sell sound products well packed, at the lowest prices consistent with financial solvency, and to sell those products in the greatest volume that is practicable.

Return to State Tariff—Disguised

ACCORDING to the Bureau of Agricultural Economics, Department of Agriculture, in an article in "The Agricultural Situation," August, 1938, in the dairy industry are striking examples of trade barriers against the interstate movement of farm products. In some cases, barriers have been erected frankly to exclude or to hamper the sale of out-of-state dairy products, in others the barriers are disguised as sanitary laws and regulations.

"Many cities and states limit the area from which cream or milk may come by restricting the area to which they will send inspectors or in which they will grant licenses or permits. In New York City the inspection has been limited in the last twelve years so as practically to exclude Western cream from that market.

"A type of market limitation which comes under the head of health regulations has to do with pasteurization and transportation to the market. In 1932, a New York upstate city required that no new permit should be issued to milk distributors unless they had a processing plant within the city limits.

"There is an increasing tendency to impose inspection restrictions on butter, condensed and evaporated milk, cheese and ice cream mix, as well as on milk and cream.

"There has been a striking increase in consumption of evaporated and condensed milk in recent years, attributed largely to the relatively high prices for fluid milk. Fluid milk producers, alarmed at this trend, have sought and in some cases obtained, legislation unfavorable to evaporated and condensed milk. Pressure has been brought to bear in some states to forbid the sale of dry, evaporated or condensed milk from herds unless the herds have been certified as free from tuberculosis. Recently, there has been agitation in certain Eastern states for the passage of state laws requiring labels on food products showing the state of origin. This would, of course, increase somewhat the cost of such products as condensed milk.

"The insistence of cities and states upon their own regulations and inspection by their own officials, reaches rather absurd limits in areas where production is normally carried on for more than one market. Ice cream manufacturing plants in many parts of the country report, for example, that farm sources of cream supply are often subject to inspection by three, four, or even more state, county or city health departments.

"The Federal Trade Commission in its investigation of the New York milk sales area found that usually each state, subdivision of a state, and municipality insists on making its own inspection and will not accept inspections by authorities of other jurisdictions. Operators of country receiving plants and farmers supplying them sometimes find it necessary to submit to as many as seven or more separate inspections.

"A major step forward would be accomplished if states and municipalities would recognize and clearly state the purpose of their regulations. If, after open consideration, the decision is made to protect state dairy interests, then the question may well be faced as to whether this should be done through health regulations or by more direct means."

But why state barriers? The first ten years after the Revolution were chaotic. Each state had its own currency—its own tariff regulations. The constitution adopted at the end of this disastrous period, contained two fundamental concepts—federal currency and none other—no state tariffs. The free interstate flow of commerce which resulted is in no small measure responsible for the growth and prosperity which followed in this country. And now, after all these years of prosperity, we have forgotten our lesson and turn to state tariffs—not open and acknowledged tariffs, but often none too cleverly disguised tariffs.

Milk is not the only food product protected in some localities by state tariffs—disguised. Wisconsin wants the south to use Wisconsin butter and dairy products, but erects a barrier against products of Southern cotton farmers. So do other states. Not a few states stopped beer from other states at the border to collect a tariff —disguised. Some protect local industries by regulations of out-of-state trucking. Stopping the flow of products from plant quarantine districts has been used to eliminate competition as well as to prevent the spread of diseases or pests.

It may be temporarily profitable to industry to be protected by state tariffs — disguised — but why risk wrecking an economy which has proved more successful than that of any other country.

Simple Device to Improve Public Relations

THE NETHERLANDS DAIRY, Syracuse, N. Y., employs a simple, inexpensive device to further better public relations. At the end of a narrow hole through which each driver-salesman must pass on the way to his truck is a full length mirror. Above the mirror is this sign: WOULD YOU BUY MILK FROM THIS MAN? Instinctively, the driver checks up on his personal appearance before going out to meet his customers.

Another Cure for Bread Infection

FOUR HUNDRED LOAVES of Pepperidge Farm bread are mailed each week from the Connecticut bakery to all parts of the country. Some of these loaves reach consumers as long as five days after baking (FOOD INDUSTRIES, November, '38, pp. 630-31). These mail orders have been going out during the last year and not once during this time has there been any complaint from the mail order customers of either rope or mold infection of the bread. Only recently, since the bread is getting extensive distribution through local retail outlets, has any complaint come to the bakery. Upon investigation of the retail outlet from which originated the complaint, the source of the infection was readily discovered. In the back part of the store or basement, screened from the sight of customers, were moldy accumulations of fruits, vegetables, meat scrap and other perishables. The most meticulous disease preventative methods employed in the bakery, necessary though they are, cannot overcome or eliminate infection spawned in the unsanitary backrooms of carelessly operated retail outlets. Much can, however, be accomplished by education.

Pointers on Paint Shops

Answers to questions about operating them

SHOULD FOOD COMPANIES set up paint shops to serve their motor vehicles? And if so, how many trucks are needed to keep a shop busy, how many trucks can one painter keep in condition and ought minor body repair work be done in the paint shop? These questions are answered by food company executives in the following symposium.

One Truck a Week Per Man

If the man in charge of the fleet is competent and if there is space in the building, it is more economical for a company to have its own paint shop for trucks. As to how many cars needed to make a paint shop pay, this is somewhat dependent on how often the trucks have to be repainted. In our case, we figure when the fleet has 50 or more trucks it can keep a full-time painter busy.

One painter can paint on the average of one truck a week. Actually, it takes less than a week to paint the average ½-ton to 1½-ton panel truck. But with some touch-up work to do, one man can average one truck a week. By painting, we mean putting on one undercoat and one top coat.

It has been our practice to have body work done by outside contractors, excepting minor repairs.—MORRIS COHEN, *industrial engineer, Interstate Bakeries Corp., Kansas City, Mo.*

Paint Shop Economical

It is economical for our company to operate our own paint shop for trucks and commercial cars. We do not know how many trucks you have to have before this operation becomes profitable, but we have a very good paint shop which takes care of about 110 trucks, cars and wagons. This paint shop is operated with one first-class painter and a helper.

We have found it very economical to do our own body and repair work in our paint shop—LOUIS R. LIPMAN, *Parkway Baking Co., Philadelphia.*

100 Trucks for Paint Shop

The number of trucks owned by a company would be the governing factor in determining whether it is more economical for a company to own its own paint shop. We think a company should own at least 100 trucks before it would pay to set up its own shop. Such a paint shop would require three men.

We don't believe it advisable to have paint work done on the premises by a contract painter charging so much per job. And repair work on trucks should be done in a separate shop.—E. BARBER, *general sales manager, Ice Cream Division, Abbotts Dairies, Inc., Philadelphia, Pa.*

Paint Shop Not Economical

It is not economical for a company to operate its paint shop for commercial cars and trucks.

Before a company sets up a paint shop of its own, it must have 50 or more vehicles, and two men will be required to operate a paint shop of this capacity.

It never is advisable to have paint work done on the premises by a contract painter who charges so much a job. It does not pay to do body repair work in the paint shop. This should be farmed out.—GEORGE GREANEY, *Transportation Department, Diamond Ginger Ale, Inc., Waterbury, Conn.*

Own Shop Does Better Work

OUR EXPERIENCE indicates that it is decidedly economical to operate our own paint shop.

A truck fleet requiring annual repainting should, from our experience, maintain one painter for every 80 to 100 original and repaint jobs.

Our experience indicates that our own paint shop is far superior, from a quality standpoint, to any contractual arrangement.

We feel it is a good investment to handle minor wood working and metal body repair in our paint shop.—M. W. MICHIE, *transportation manager, Geo. A. Hormel & Co., Austin, Minn.*

50 Trucks for Paint Shop

WHILE it might at times be economical for a company to operate its own paint shop for trucks and commercial cars, the size of the fleet, location of the company, and so on, are factors to be considered. A company would have to operate at least 50 trucks before a paint shop would pay for itself.

A better job of painting could be done off the premises than by a contract painter working on the premises. But from an economy standpoint, a saving could undoubtedly be made by having a contract painter do the job on the premises.

If a company operating motor vehicles maintains a regular carpentry shop on the premises, it would be advisable to have minor body repair work done by the regular carpenter. However, to keep a carpenter on steady to do body repair work would hardly pay unless the fleet operated was a very large one.—L. PETH, *transportation department, United Dressed Beef Co., New York, N. Y.*

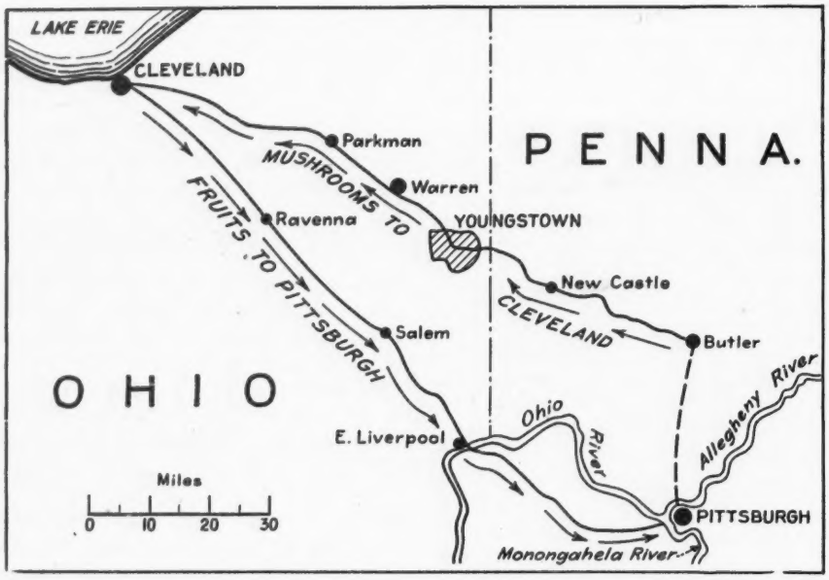
Advises 100 Trucks for Shop

Yes, we believe that it is sometimes economical for a company to operate its own paint shop for trucks and commercial cars. But a company ought to have 100 trucks or cars before setting up such a paint shop. Two men will be required to operate the shop.

In regard to body repair, minor jobs could be done, such as straightening fenders and filling small dents. —D. R. BOYER, *superintendent of motor vehicles, Hathaway Bakeries, Inc., Cambridge, Mass.*

Taking Mushrooms to Market By Motor Truck

Cleveland hauler gets mushrooms from Butler, Pa., and backhauls produce to Pittsburgh



Cleveland epicures get some of their fresh mushrooms by truck over the 115-mile run shown above from Butler, Pa. The truck carries loads of fresh produce back over the 130-mile route to Pittsburgh.

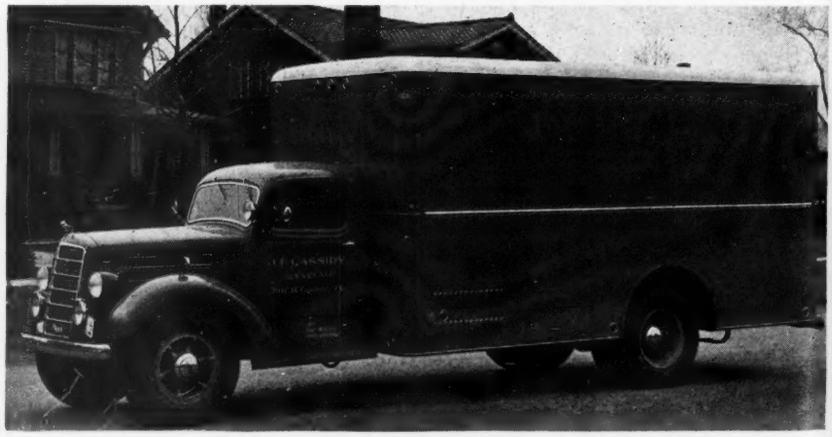
KEEP THEM COOL. That is the answer to the question of what precautions have to be taken to transport fresh mushrooms over the road by truck. The mushrooms should be kept within a range of 35 to 40 deg. F., and be packed carefully so as to prevent crushing at the bottom of the load. This has been the experience of J. F. Cassidy, of Cleveland, who daily brings into Cleveland fresh mushrooms from Butler, Pa., and backhauls produce to Pittsburgh.

The one-way haul by truck from Butler to Cleveland is 115 miles. The distance between Cleveland and Pittsburgh is 130 miles and that between Pittsburgh and Butler, 30 miles. The round trip distance is thus 275 miles. Making a round trip daily, the truck's weekly mileage is approximately 2,000 including local pick-ups and deliveries in Cleveland.

The problem of refrigeration while in transit was first taken up with the chief chemist of the Butler County Mushroom Growers' Assn. While there was little prior data available on the handling and transportation of mushrooms and the rate of respiration in transit, preliminary tests showed that some degree of refrigeration was desirable. Subsequent experience has shown that when the mushrooms are maintained at between 35 and 40 deg. F. while in transit, they arrive at their destination in excellent condition.

With the desirability of a certain degree of refrigeration thus agreed upon, J. F. Cassidy equipped a 5-ton Model EH Mack chassis with the mechanically-refrigerated body made by Warnsman, Inc., of Cleveland, and shown in detail in accompanying illustrations. The body is insulated with 4 in. of Dry-Zero Sealpad in the roof, 2 in. of the same material in the sides and ends and 3 in. of cork in the floor.

The body interior is clear. No shelves are fitted. The only projections in the body interior are the rectangular tops of the wheel housings on the floor and a similar projection at the left front end. The latter accommodates the top of the compressor of the refrigerating system which is carried beneath the floor and the bottom of the body skirt, as shown in one of the accompanying views. Wheel housings were employed to give a



This is the truck which carries the mushrooms. It is a 5-ton Mack owned by J. F. Cassidy of Cleveland. It has a mechanical-refrigerated body which keeps the mushrooms at between 35 and 40 deg. F.

lower floor line and provide a lower center of gravity of the body to minimize body sway on rough roads. The interior body dimensions are: length, 198 in.; width, 89 in.; and height, 79 in.

In the body, the fresh mushrooms are carried in wooden crates and covered baskets. These can be stowed to prevent shifting in transit and are strong enough to prevent crushing of the mushrooms in the receptacles at the bottom of the load. Each crate incloses a dozen or more of the smaller packages or open-top wooden measures of mushrooms such as are seen in most retail markets. Mushrooms for hotels, restaurants and other wholesale accounts are usually packed in the familiar covered, circular, wooden basket.

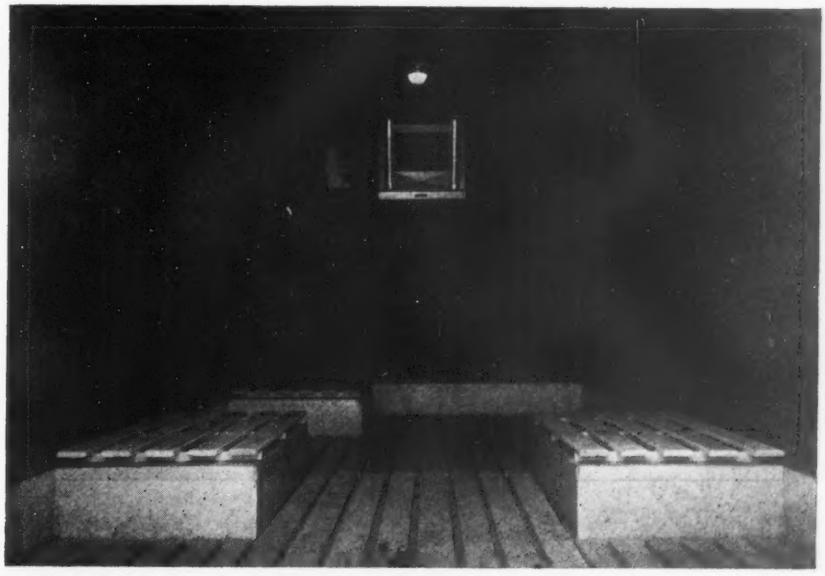
The body is refrigerated mechanically by means of the Whitaker-Upp system described in detail in Food Industries, September, 1936. The Whitaker-Upp equipment is used in conjunction with a 1 hp. Kelvinator special truck type compressor and a Peerless forced draft convection coil or evaporator.

The evaporator coil is mounted inside the body at the front, near the roof, as shown in the accompanying view of the body interior. The cooling refrigerant is forced by the compressor through the evaporator coil, behind which is a small electric blower fan which circulates the body air over the coil and thereby cools it.

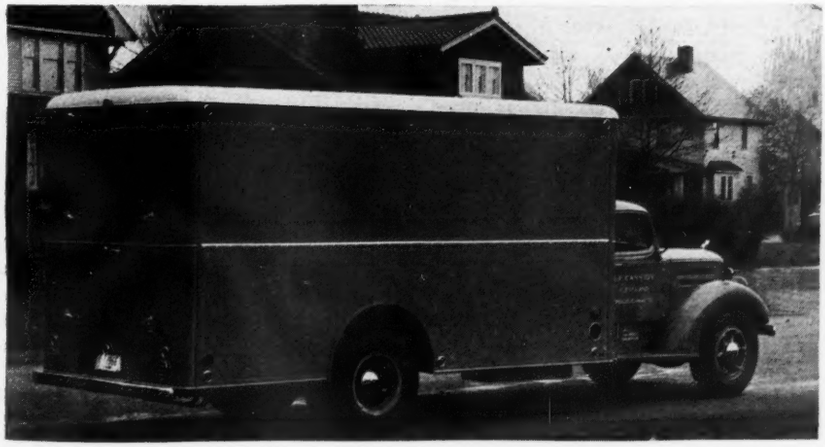
The compressor in turn is operated by a dual d.c.-a.c. motor which receives its d.c. current from the special Whitaker-Upp generator driven off the truck engine. A thermostatically controlled expansion valve regulates the operation of the compressor to provide the required inside body temperature. To maintain this temperature, the compressor should be run at a constant speed. And it should be shut off when the minimum temperature limit is reached and automatically started up again when the temperature has risen to the maximum limit. This is the same operating cycle as that followed by the conventional domestic electric refrigerator.

It is easy to operate the compressor of the household refrigerator at the required constant speed because its driving motor is connected into the constant-voltage house line. But with the generator driven off the truck engine, the voltage fluctuates with the engine speed. This is where the need for the special Whitaker-Upp generator arises. It supplies a constant voltage, no matter what the truck engine speed. This constant voltage is attained by the use in the Whitaker-Upp unit of two generators in a single frame. One, a low-voltage machine producing either 6 volts or 12 volts, according to the truck's ignition system, automatically compounds the other, which generates high voltage, to maintain a constant voltage output.

During the operation of the truck over the road, the refrigerating compressor or condensing unit is driven by the d.c. end of the dual motor with the constant-voltage power produced through the Whitaker-Upp generator driven by the truck engine. When the truck engine is stopped, as is the case when the truck is at the loading dock or held over night in a garage at either end of the run, the same interior body temperature can be maintained by operating the compressor through the a.c. end of the dual motor. This may be done by plugging it into any house line of 110 or 220 volts, 50 or 60 cycles.



Interior of refrigerated body built by Warnsman, Inc., Cleveland. Racks on floor and on top of floor projections permit circulation of cooling air under the bottom of load. Projection in front left corner is to accommodate top of compressor carried under floor. Note also interior lights and position of the cooling coil and blower fan hung from the roof at the front end of the body.



Rear view of the Warnsman body. It has no side doors. Loading and unloading are through a double door in the rear. Wheel housings are used to give a low floor height and a low center of gravity.

As further evidence of the desirability and effectiveness of the refrigerating system previously outlined, the truck pictured herewith transported a special load of celery last summer from Cleveland to Boston. This is a road distance of approximately 650 miles. Yet the condition of the celery on arrival at Boston was so much better than when transported on non-refrigerated trucks that it commanded a materially higher price.

Food Technology

NEW DISCOVERIES AND INVENTIONS

PACKAGING

Coated Aluminum Foil for Cheese Wrappers . . . A Correction

In FOOD INDUSTRIES, August, 1938, page 450, an item was published under the above title, in which the thickness of aluminum foil and corrosion-resisting film used in wrapping cheese were incorrectly given. The item should have read:

"Aluminum foil for wrapping melted cheese is subject to rather severe and rapid corrosion, so it must be protected by a corrosion-resisting film. On the basis of a systematic testing program, the principles which govern successful protection of the foil wrappers are stated. The foil and film must provide perfectly air-tight protection of the cheese. The aluminum foil itself must have a minimum thickness (preferably 0.012 mm., i.e., 0.005 in)., and must not show any pronounced scoring by the rolls in which it was made. The film coating should have no discontinuities and should not contain too many air bubbles. It must have good resistance to heat and strength to withstand mechanical stresses. It must retain good flexibility and should be, for all practical purposes, impermeable to weekly acid liquids. The film thickness should not be less than 0.005 mm (0.0002 in.). Coated aluminum foil which meets these requirements is an excellent and serviceable wrapper for melted cheese."

Digest from "Testing Coated Aluminum Foil for Melted Cheese," by E. Erbacher and H. Haug. *Deutsche Molkerei-Zeitung*, 59, 108, 1938 (Published in Germany).

How to Reduce Milk Bottle Losses

MILK BOTTLES have an average life of 34½ trips, though most of them average only 28 trips. The extremes, however, range from 6 to 91 trips in a study of 111 plants. Non-return of bottles rather than actual breakage is the greatest source of loss. Hence to get the bottles back, there must be created incentives to their return.

Charges for bottles to stores and route salesmen to compel returns, bonuses to stimulate returns, bottle exchanges, bottle pools, special municipal regulations, and publicity and education are the broad categories into which fall the efforts to minimize losses.

Methods which have fewest disadvantages are: payment to route men of a commission for return of bottles; a charge of full bottle price to stores; and establishment of a milk bottle exchange.

Many cost figures and voluminous statistics are included.

Digest from "Milk Bottle Losses and Ways to Reduce Them," by C. E. Clement, Bureau of Dairy Industry, U.S. Department of Agriculture, Circular No. 469.

FOOD ENGINEERING

Fruit Storage Without Mechanical Refrigeration

FRUIT GROWERS IN POLAND, under government guidance, are learning to store apples and other fruit into the winter—even until late spring—without resorting to artificial refrigeration. The plan is particularly applicable where production is not sufficiently concentrated in one locality to make a central cold storage warehouse profitable. Each orchard, or a few neighboring orchards in cooperation, must build a natural cold storage house where low seasonal temperatures keep the fruit cold, but freezing is prevented.

The essential structural features of such a storage house include a lattice floor with air space under it, double walls between which air circulates freely, a heat-insulated roof and a ventilating flue. These storage rooms are built largely or entirely below ground, often under the packing shed.

About 4 to 5 cu.yd. of space are allowed for each ton of fruit. Ventilation should be so effective that three changes of air can be made in an hour. When a cold day or night has been utilized for lowering temperature in the storage room, the temperature-rise, with doors and ventilators shut, should be so slow that outdoor fluctuations do not affect it appreciably. No elaborate or expensive heat insulation is needed; sawdust or straw will give good results.

Digest from "Construction and Operation of Air-Cooled Fruit Storage Houses," by Damazy J. Tilgner, *Zeitschrift für die gesamte Kälte-Industrie* 44, 136, 1938 (Published in Germany).

BAKERY PRODUCTS

Lactic Acid Bacteria for Better Quality Control in Baking

BY PROVIDING more exact means for regulating acidulation of the dough in bread making, control of quality has been improved. The essential feature of the invention, as described in German Patent 654,638 (granted Dec. 24, 1937, to Otto Beyer of Köszeg, Hungary), is the mutually adjusted proportioning of yeast and a pure acid-forming microorganism in the dough. Depending on the selected recipe, the dough is first prepared without yeast or bacterial culture. A dry mixture of a carefully prepared yeast and a pure culture of lactic acid bacteria is then introduced into the dough, without adding any nutrient medium for the bacterial culture. The yeast and bacteria are employed in known quantity, so proportioned that at least one lactic acid bacterial cell is present for every yeast cell. Sugar and protein may be introduced into the dough as needed, either as a carrier for the bacterial culture or otherwise.

Cakes High in Sugar Content

CAKES containing 30 to 50 per cent more sugar than flour made by old time bakery methods are heavy and soggy in texture, small in volume, and are anything but marketable in appearance.

Made according to the method disclosed in U.S. Patent No. 2,123,880, they are described as having highly prized moistness, sweetness, and volume and as being of unusually fine

texture, flavor, and keeping quality. The addition of as little as 0.025 per cent of ordinary soap to the batter is responsible for the difference, provided a mono-, a di-, or a mixed mono-and diglyceride shortening is used. If a triglyceride shortening, such as a hydrogenated plastic fat, is used the quantity of soap required may range from below 0.05 to more than 0.4 per cent of the total weight of the batter.

While other soaps in varying quantities may be used, the preferred one is the sodium salts of oleic mixed with small proportions of palmitic and stearic acids; all of edible grade. Granted to Herbert S. Coith, Albert S. Richardson, and Verling M. Votaw, the patent is assigned to Procter and Gamble Co., Cincinnati, Ohio.

BEVERAGES

Beer from Grapes

BEER CAN BE MADE from grape juice, according to a Greek invention which has also been patented in France (French Patent 827,039, granted April 14, 1938, to Fotis Pondikis, of Greece). Hops are used as in ordinary brewing, and the fermentation process is the same, but the wort is composed of grape juice instead of a malted cereal wort. For enrichment of the extract, a dextrin solution and an aqueous extract from dried figs may be added. The resulting beer has a characteristic flavor.

Wine Clarified with α-Cellulose

HIGH DEGREE of removal of iron from wine and other beverages without injurious effect upon flavor and health-promoting properties is claimed for the use of α-cellulose as a filtering and clarifying agent, according to U.S. Patent No. 2,128,432 granted to William D. Ramage, Berkeley, Calif.

To get best results, a high grade α-cellulose with a low iron content is specified. While suspended particles are removed by filtering the beverage through a pad of α-cellulose, dispersion of α-cellulose fibers in the wine is recommended for removal of the colloidal form of the cloud- or haze-forming substances.

This property of α-cellulose is explained on the basis that most colloids in wine carry a positive electron charge whereas the α-cellulose, because of the method of its manufacture, contains adsorbed hydroxyl groups that neutralize and coagulate the wine colloids.

The degree of completeness with which the iron is removed depends upon the iron content of the wine before treatment and upon the acidity of the wine. No dissolved iron is removed by α-cellulose from acid wines. It works progressively better as the beverages treated are less and less acid in character. If a final iron content of less than 4 parts per million is wanted, the α-cellulose has to be given special treatment to increase its adsorbed hydroxyl content but with possibility of injury to the flavor of the wine or other delicately-flavored beverage treated.

CHOCOLATE

Cattle Feed From Cocoa Bean Shells

AN IMPROVEMENT in byproduct utilization offers the chocolate industry an opportunity profitably to dispose of cocoa bean shells. The shells remaining after liberating the beans by the customary fermentation method are not readily acceptable as cattle feed because of bitterness, yet to discard them is to waste thousands of tons of potentially nutritious material. The answer to the problem is a supplementary fermentation which performs a dual function. First, it improves the food value of the material by protein enrichment, i.e., by a biochemical synthesis of proteins not originally present. Second, in so doing it destroys the bitter principles contained in the raw shells so that the product is palatable to cattle.

The process can be initiated simply by providing suitable conditions for the wild yeasts, always present in the shell residue, to develop and grow. Still better results are obtained, however, by making pure cultures of the yeasts naturally present on raw cocoa beans, and adding these cultures when the waste shells are to be fermented. The product is well liked by cattle and has high food value (17.27 per cent digestible crude protein, 6.47 per cent crude fat) and good vitamin potency, with excellent keeping qualities.

Digest from "Utilizing Cocoa Bean Shells in Biological Protein Synthesis," by G. Pfeiffer, *Chemiker-Zeitung* 62, 718, 1938 (Published in Germany).

DAIRY PRODUCTS

Keeping Quality Of Butter

DAIRY SCIENCE does not as yet know any bacteriological or chemical test by which the keeping quality of a sample of fresh butter can be predicted before it is consigned to cold storage. But a comparison has been made, on the basis of many tests and experiments, between sour and sweet cream butters. The test program showed that a good grade of sour cream butter keeps perfectly under proper refrigeration conditions for as long as 5, 6 or 7 months. Some samples were even better after storage than when fresh.

Sweet cream butter is more sensitive to storage conditions, but part of the difficulty is in correct preparation of the sweet cream, and most particularly in the neutralization treatment. A common error is over-neutralization, and the storage tests showed that sweet cream butter retains its freshness and original quality better when the neutralizing agent is limited to the exact amount needed, no excess being added to the cream.

Another defect of sweet cream butter is that it tastes somewhat insipid as compared with sour cream butter. Like color, this can be corrected artificially (by adding a synthetic butter aroma substance), but at present it is illegal in Germany to add such substances to butter.

Digest from "Storage Butter From Sweet or Sour Cream?", by Mohr and Ritterhoff, *Molkerei-Zeitung*, 52, 808, 1938 (Published in Germany).

Coffee and Cream Feathering

IN CASES of cream feathering in coffee, it is sometimes the coffee that is the cause. A highly roasted coffee or an old, stale coffee increases the chance of feathering, since their brews are more acid. There is a variation between different blends of coffee in their tendency to cause this defect. There is no difference between wet- and dry-cured coffee, nor does the strength of the brew have any effect. There is little choice between boiling, percolating or dripolating, although the last causes slightly more feathering. To avoid this, add the cream to the coffee rather than the coffee to the cream.

Digest from "Coffee as a Factor in the Feathering of Cream," by P. H. Tracy and W. J. Corbett, *Journal of Dairy Science*, 21, 483, 1938.

Gassy Brick Cheese

IN WINTER and early spring, Brick cheese at one to two weeks old may become gassy in spots, or throughout, to such an extent that the centre of the cheese splits. The bacteria causing this "late gas" come in the milk and probably originate in the barn. They are extremely hardy and pasteurizing does not destroy them. Prob-

(*Turn to page 718*)

Just Off The Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

BATCHING SCALES — Automatic batching scales for use in precision manufacture of mixes are described and illustrated in Bulletin 385, of Buffalo Scale Co., Buffalo, N. Y.

COFFEE ROASTING EQUIPMENT—Jabez Burns & Sons, Inc., 11th Ave. and 43d St., New York, N. Y., has issued a 24-page illustrated folder, Bulletin 23R6, showing Thermalo equipment for coffee roasting.

DIGESTION AND DISTILLATION EQUIPMENT—The Duriron Co., Inc., Dayton, Ohio, has issued Bulletin No. 1202-A, describing Duriron Kjedahl and other digestion and distillation equipment.

PROCESSING EQUIPMENT — Catalog 660, a 48-page illustrated bulletin discusses the full line of swing hammer shredders for reducing fibrous materials, made by The Jeffrey Mfg. Co., Columbus, Ohio.

PROCESSING EQUIPMENT — Sharp Bros., Bayonne, N. J., have issued an illustrated folder describing machinery for forming and cutting butter, cheese, margarine and yeast.

PROCESSING EQUIPMENT—"Vitreo" porcelain enameled equipment for use in food process industries is described in folder published by Vitreous Steel Products Co., 6700 Grant Ave., Cleveland, Ohio.

SEPARATION EQUIPMENT—"Separating Dry Commodities by Specific Gravity" is the title of a 12-page illustrated bulletin issued by Sutton, Steele & Steele, Inc., Dallas, Texas, discussing cleaning and grading of dry granular materials, such as seeds.

Plant Accessories and Supplies

AUTOMATIC VALVE CONTROL—"Limitorque Control" is the title of a 48-page bulletin issued by Philadelphia Gear Works, "G" St. below Erie Ave., Philadelphia, Penn., on automatic valve control equipment, illustrated with blueprints, tables and photographs.

BOILER FEED CONTROL—Northern Equipment Co., Erie, Pa., has issued Bulletin 413 entitled "Controlling Boiler Level on Combined Utility and Sugar Plant Load" by J. H. Dunlap, plant superintendent, Fort Bend Utilities Co., Sugar Land, Tex.

DIESEL ENGINE—Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y., has introduced a new diesel engine, Type RHB-100, in sizes ranging from 300 to 800 horsepower, which is described in Bulletin 769.

ECONOMIZERS—A 16-page illustrated catalog has been published by Combustion Engineering Co., Inc.. 200 Madison Ave., New York, N. Y., dealing with designs and details of "Elesco" fin-tube economizers for modern boiler plants.

ELECTRIC MOTORS—Harnischfeger Corp., 4400 W. National Ave., Milwaukee, Wis., has published Bulletin M-2, "P&H Convertible Slip Ring Motors," a recent addition to its catalogs on electric motor equipment.

HEAT DIFFUSERS—Engineering details, including diagrams, dimensional tables and applications for unit heaters and heat diffusers, are given in a 32-page illustrated bulletin published by Carrier Corp., Syracuse, N. Y.

ROLLER CHAINS—A 174-page catalog, Book No. 1757 (1938 edition), bound in flexible imitation leather, entitled "Link-Belt Silverlink Roller Chains and Sprockets," giving complete data on roller chains and sprockets used in power transmission and materials handling equipment, has been published by Link-Belt Co., 300 W. Pershing Road, Chicago, Ill.

SPEED REDUCER TRANSMISSION—Catalog No. 68, Stephens-Adamson Mfg. Co., Aurora, Ill., describes the JFS motor reducer, combining variable speed transmission and speed reduction in one unit.

STEEL VALVES—Bulletin 5-700, describing and illustrating forged and cast steel valves, for pressures to 4,000 lb. and temperatures to 1,000 deg. F.. has been issued by the Hancock Valve Division, Manning, Maxwell & Moore, Inc., Bridgeport, Conn.

TUBING—A recent booklet issued by Metal Forming Corp., Elkhart, Ind., discusses the application, corrosion resistant properties and specifications of welded Monel metal tubing.

VACUUM PUMPS—Catalog No. 38-P describing high vacuum pumps in five sizes, from 10 to 225 cu.ft. capacity, for use in processing operations, has been issued by F. J. Stokes Machine Co., Olney P. O., Philadelphia, Pa., with illustrations, specifications, charts and application data.

VALVES AND FITTINGS—A loose-leaf catalog describing and giving specifications of "Aloyco" stainless steel valves and fittings has been issued by Alloy Steel Products Co., Inc., Linden, N. J.

Control Equipment

CONTROL INSTRUMENTS—The Bristol Co., Waterbury, Conn., has brought out two new bulletins as follows: Catalog No. 1250, a new general catalog of small types of indicating, recording and controlling thermometers; Bulletin 507, describing the "Pyromaster" recording potentiometer for use in various types of control instruments.

CONTROL INSTRUMENTS—The Foxboro Co., Foxboro, Mass., has issued a 32-page illustrated bulletin, No. 184-2, describing the "Rotax" electric-operated control system for temperature, pressure and flow.

INDICATING PYROMETERS — Leaflet A-382-S, issued by Thwing-Albert Instrument Co., 3339 Lancaster Ave., Philadelphia, Pa., describes wall and portable type indicating pyrometers, scales, galvanometers, high temperature pyrometers and portable pattern indicators.

INDUSTRIAL CONTROL INSTRUMENTS —"Tag Instruments for Breweries, Distilleries, and Wineries" is the title of a 34-page illustrated catalog, No. 1180, published by C. J. Tagliabue Mfg. Co., Park and Nostrand Aves., Brooklyn, N. Y., which describes indicating, recording and controlling instruments, suitable for use in these industries.

PROCESS CONTROL INSTRUMENTS—Installations using coordinated process control in manufacturing processes are described in Bulletin 511 of The Bristol Co., Waterbury, Conn.

RECORDING GAGES—Bulletin No. 208 presents information, illustrations and specifications of recording gages and accessories for pressure control, manufactured by The Foxboro Co., Foxboro, Mass.

Food Equipment News

REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES

Pasteurizing Equipment for Fruit Juices

EQUIPMENT for the rapid pasteurization and cooling of fruit juices in cans has been developed by Thermal Engineering Corp., Richmond, Va. This equipment, called the "Thermo-Roto," has been tried out for three canning seasons and is now available for general distribution.

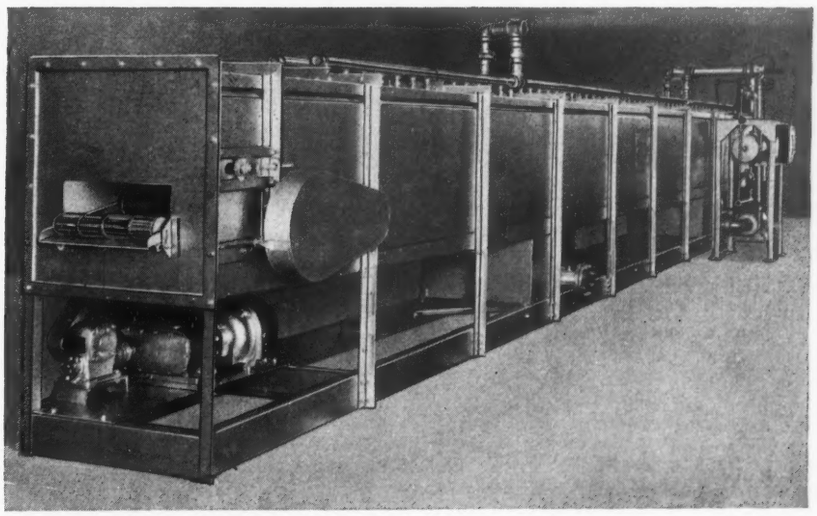
In the "Thermo-Roto," cans are conveyed rapidly through the machine on horizontal rolls which have their axes of rotation at right angles to the can travel. These rolls are arranged as an endless belt, moving through the machine and returning beneath. At the same time, these rolls are caused to rotate around their axes.

The cans, in passing through the pasteurizer, are rotated by the rotating rolls upon, or between, which they rest. That is, the cans are caused to rotate about their own axes at the same time that the conveyor moves them forward. Above the cans are perforated pans containing water so that the cans are sprayed as they pass.

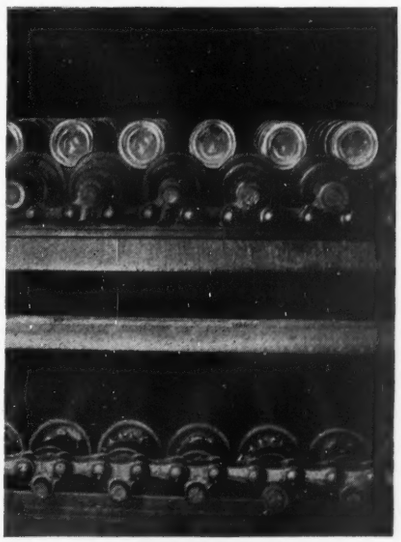
The machine is divided into hot and cold sections, and the pans in each section are made up in several different compartments. Spray water from the hot section, after heating the cans, falls into a tank beneath the can rolls. From here, the water is pumped through a heat exchanger to the spray pan above for recirculation. Thus loss of water is at a minimum.

By this method, the whole contents of the can is raised from 70 deg. F. to 180 deg. F. in 90 to 100 seconds, as compared to 30 to 50 minutes required by some other methods. Cooling follows heating with like rapidity.

The reason for this design is that it speeds up heat transfer. If a can is surrounded by water, as in a cooker, the layer of water next to the can cools because of the relatively low temperature of the can, while inside the can, the layer of juice next to the metal becomes very warm compared to the juice in the interior of the can. Since heat transfer through the can is proportional to temperature difference, it is evident that heat transfer is hastened by rotating the can so as to prevent the formation of these stagnant films on either side of the metal.



Exterior view of fruit juice pasteurizer.



Interior view of fruit juice pasteurizer.

In developing the pasteurizer, it was found that a critical speed of can rotation exists. When the can rotates at low speed, a different set of currents is set up than when it rotates at high speed. At low speed, the rotating bubble, or head space at the top of the container, acts in the same manner as an internal gear and rotates in the same direction as the container. This rotating bubble, however, causes the contents of the container to operate in an opposite direction to the rotation of the container. As the speed is increased, a critical speed is reached, at which the direction of rotation of the container contents changes, so that it rotates with the can. Large increases in rotating speed above this critical point do not materially affect the heat transfer.

Advantages claimed for this heater are: (1) It preserves flavor and color, as time required for heating and cooling is greatly reduced over other methods and there are no prolonged high temperatures; (2) Various sizes of metal and glass containers are handled on the same machine without adjustment and simultaneously, if desired; (3) There is thorough pasteurization with absolute heat penetration; (4) Machine cannot jam or damage containers; (5) Machine is automatic, requires small floor space, and speeds production; (6) Discharge is uniform and can feed directly to labeling machines.

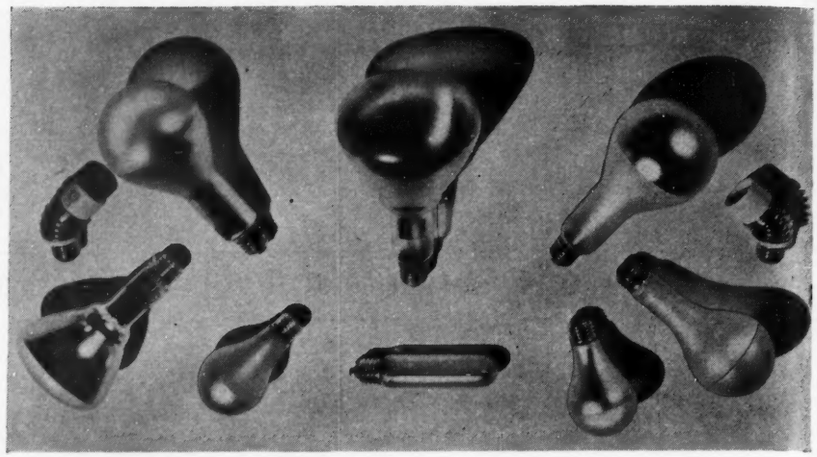
Reflector Lamps

BIRDSEYE ELECTRIC CO., 100 East 42nd St., New York, N. Y., is distributing a line of inside silvered incandescent lamps manufactured according to an invention of Clarence Birdseye, who developed the Birdseye method of quick-freezing foods.

These lamps dispense with the use of external reflectors. Silver is deposited on the inside of the bulb, forming a reflecting surface that dirt or fumes cannot reach. Lighting efficiency is thus maintained without the expense of cleaning exposed reflectors.

Birdseye lamps are available in various sizes and shapes, as indicated by the accompanying photograph, in order to direct the light effectively. In addition, the filament is placed in an optically correct position, rather than at the equator of the bulb as in other designs of incandescent lamps. Thus, practically all of the light from the filament is thrown where needed, producing more usable light per watt.

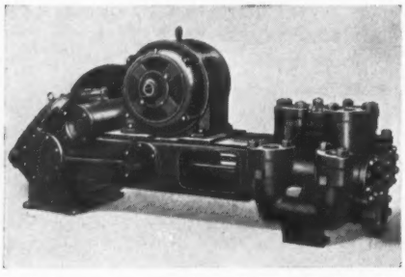
Swivel sockets are available with these lamps, to give full directional flexibility.



Birdseye inside-silvered reflector lamps and swivel sockets.

Power Pumps

FOR HANDLING both free-flowing and viscous liquids, Fairbanks, Morse & Co., 900 South Wabash Ave., Chicago, Ill., has developed a new line of duplex power pumps. These have



Duplex power pumps for food liquids.

eight-cover side-pot type fluid ends and enclosed, self-oiling power ends with herringbone gears and large roller bearings.

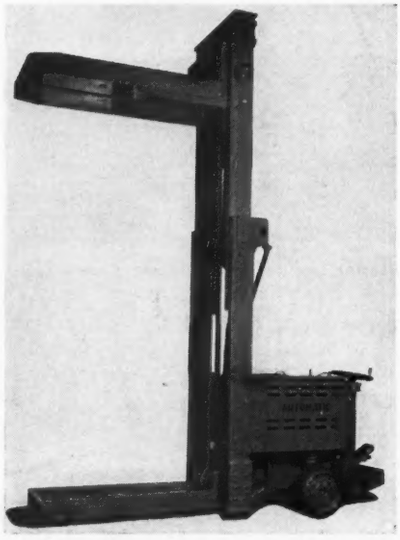
Capacities of this line of pumps range up to 187 gal. per minute, and pressures up to 1,000 lb. per sq.in. The line is available with pulleys for belt drive or with self-mounted motors.

Self-Aligning Belt Idler

JEFFREY MFG. Co., Columbus, Ohio, is making a self-aligning idler for automatically training conveyor belts without damage to the belt. It consists of a standard anti-friction idler pivotally mounted on a supporting cross-member, with guide rolls at each end. These guide rolls are mounted on pivoted arms that extend at right angles to the idler in the direction from which the belt approaches. The arms are held in place by a removable locking pin. By swinging the arms through 180 degrees and putting the lock pin in place on the opposite side, the guides are made ready to train the belt when traveling in the reverse direction. As there is no pressure between the guide rolls and belt, there can be no damage to the edge of the belt. The guide roll moves outwardly the instant the belt touches it and, in doing so, swivels the idler sufficiently to cause the belt to return to normal position.

High Lift Electric Truck

AUTOMATIC TRANSPORTATION CO., 101 W. Eighty-Seventh St., Chicago, Ill., is making a telescopic high lift platform truck of 5 ton capacity. The purpose of this truck is to make possible the storage of material on skids to exceptional heights, and still permit operating with low head room.



Telescopic high lift platform truck.

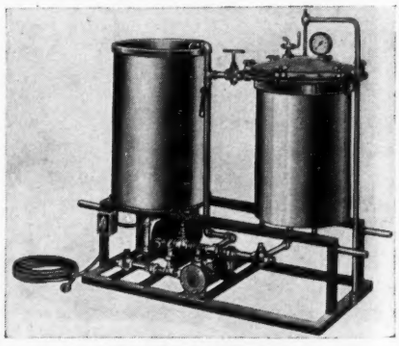
The truck lifts to a height of 14 ft. when telescope uprights are fully extended. When uprights are telescoped the lift is 7 ft. 7 in. Platform dimensions are 36 in. wide by 72 in. long. Platform height is 11 in. in low position.

Filtering Unit

AMERICAN SEITZ FILTER CORP., 480 Lexington Ave., New York, N. Y., has developed the "Seitz Tank Furka," featuring a cylindrical filtering unit. This cylinder provides a larger filter surface in a compact container and is claimed to be simpler to operate than an alluvial filter with a series of square screens. When cleaning, there is only the cylinder screen to remove.

In operation, a thin layer of asbestos is floated on the frames, followed by filter aid or charcoal. The asbestos absorbs the finest particles of turbid matter immediately upon setting, avoiding waste of time in starting and assuring a long run of clear filtrate.

This filter is made in a range from 11 to 45 sq.ft. of filter surface. It comes either as a single filter unit, or as a complete unit with filter, mixing tank, pump and motor, piped and mounted on a movable frame.



Filtering Unit

The Food Industry News

GENERAL NEWS, BUSINESS TRENDS, MEN, JOBS AND COMPANIES • DECEMBER, 1938

Some Change Expected In Food Regulations

Minor modification of proposed regulations for enforcement of the Federal Food, Drug and Cosmetic Act (FOOD INDUSTRIES, November, 1938, page 628) is considered probable as a result of hearings in Washington on Nov. 17-18. While Walter G. Campbell, chief of the Food & Drug Administration, made no positive statement on this point, observers felt that so much pressure had been exerted by the 500 trade representatives present that the government would be compelled to yield on some of the more controversial points.

The chief target of attack was the provision dealing with the so-called "front panel" of labels. This was assailed by spokesmen for all the industries, who pointed out, among other things, that this provision is impossible of enforcement and ignores practical sales problems, especially where the label and the package are small. The provision requiring printing of the post office address, including street number, was attacked as unnecessary and cumbersome by Arthur C. Spencer, National Association of Wholesale Grocers. Mr. Spencer also criticized the provision requiring contents to be divulged on the label.

It was contended by William F. Heide, candy manufacturer, that the regulations impose impossible conditions, especially where small packages are concerned. He argued that the printing of statements showing all ingredients and the use of artificial coloring and flavoring would, if enforced, deal a heavy blow to his industry. In the matter of packages of mixed candies, Mr. Heide argued, printing of all ingredients of each piece would compel manufacturers to completely alter their containers.

The proposed regulations are to be promulgated in final form on Jan. 1.

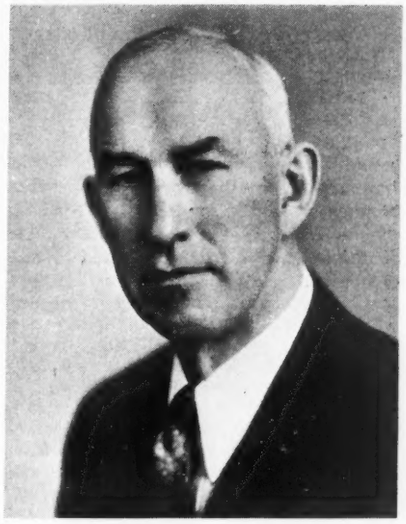
Treaty with Britain Changes Food Tariffs

In the most far-reaching of the reciprocal trade agreements negotiated by the federal government, duties on several food and farm products involved in international trade with Great Britain and Canada will be altered. Important concessions were made for American agricultural products by Great Britain, our principal overseas market. These concessions include abolishment of duties on wheat, lard, canned grapefruit and some fruit juices; reduction of the duties on rice, apples, pears and certain canned fruits; and binding on the free list of ham and certain other pork products and corn (other than flat white corn).

In return for the concessions by Great Britain on American farm products imported into that country to the extent of a $200,000,000 volume in 1936, the United States made concessions that do not affect the food industry directly except in the matter of jams, jellies and marmalades, but apply to textiles, metals, and various specialties.

Canada also agreed to tariff changes which favor American foodstuffs, including reduction in duties on fruits and vegetables and fishery products. But American concessions to Canada also pertained in part to foods. They include reductions in the duties on live cattle, hogs and pork products, cheese, eggs, grain other than wheat, grain by-products, maple sugar, potatoes, and various fishery products.

America also will receive some benefits in trade with Britain's colonies, these including binding arrangements with reference to raw products such as cocoa, rubber and tin.



HEADS ABCB
Paul F. Glaser, Glaser Beverages, Inc., Seattle, Wash.

ABCB Meeting Reflects Growth of Industry

Following the best year in the history of the beverage bottling industry, 12,000 bottlers convened at the sessions and show held by American Bottlers of Carbonated Beverages in New York last month. There were 186 companies with exhibits at the show, and a large amount of business was transacted on the floor.

Reports from bottlers attending the convention indicated that the industry's previous annual sales record of the equivalent of 13 billion half-pint bottles, worth about $350,000,000, will be surpassed by the end of this year. The industry has grown until today there are about 6,600 plants employing some 80,000 people. Its purchase of plant and delivery equipment runs into many millions of dollars each year, more than 50,000 trucks being used in distribution alone.

Speaking at a special meeting held in conjunction with the convention, Dr. Max Levine, who is in charge of the ABCB fellowship at Iowa State College, reported to the bottlers on lessons learned from beverage analyses and visits to plants. For bottlers troubled with yeast contamination in cold-process syrups, Dr. Levine recommended the acid-storage process. A very frequent source of yeast and bacterial contamination of syrup, Dr. Levine reported, consists of the color solutions prepared in the bottling plant. The colors themselves are free from objectionable bacteria and yeast, but the solutions are sometimes grossly contaminated. As a cure for this trouble, it was recommended that the portion of the color solutions to be employed be boiled for a few minutes just before using. Certified colors may be obtained in tablet form so that desired quantities of color solution may be specially prepared immediately before using, thereby avoiding the danger of yeast contamination and growth, Dr. Levine pointed out.

In a number of instances, slight sediment, which on microscopic examination, proved to be starch, had been observed in beverages. The origin of this starch has been a puzzle for a long time. But an observation was made which implicates filter cloths made from sugar sacks as one source, according to Dr. Levine.

Washing compounds and bottle washing standards were evaluated in a paper given by Dr. C. Richard Arnold, technical service, ABCB, and Dr. Max Levine. The authors revealed that investigations of the ABCB fellowship "have demonstrated very clearly that the addition of milder alkalis (sodium carbonates and trisodium phosphates, etc.) to caustic increases the germicidal properties of the latter quite materially."

What constitutes satisfactory carbonation was the subject of a talk given by Dr. John M. Sharf, ABCB technical service director. "In general," he said, "it is found that over-carbonation is as serious as under-carbonation, because of excess load which it puts on the beverage, causing 'wildness.' Likewise, it has been observed that few carbonated waters are of a type to carry more than 4.5 volumes of gas, with many very suitable at gas contents content nearer 4 volumes. Very few flavored beverages used for mixing purposes behave well with gas contents as high as carbonated water, and usually are found near 4 volumes; beverages meant to be drunk directly from the bottle behave best with carbonations in the range of 3.5 volumes, and so on down to the pulpy type beverages and those in which less pungency is desired with the least amounts of gas." Dr. Sharf pointed out also that the suspended particles in a beverage have a very deleterious effect on the carbonation.

The ABCB elected Paul F. Glaser, Glaser Beverages, Inc., Seattle, president.

Dairy Industry Accused Of Illegal Practices

In its most sweeping indictment under the Sherman Antitrust Law, the federal government last month charged 97 companies and individuals with monopolistic practices in the milk and ice cream industries. Two indictments were issued following a year of evidence gathering by hundred of government investigators. One indictment charges conspiracy to fix prices and control the supply of fluid milk in the Chicago area. Forty-three individuals and fourteen companies are named in this indictment. Among the companies are such major firms as Borden Co., Borden-Weiland, Inc., and Bowman Dairy Co. Associated Milk Dealers, distributors bargaining agency, and Pure Milk Association, agency for dairy farmers, both of Chicago, were among the defendants.

Of the individuals named in this indictment, outstanding are Dr. Herman N. Bundensen, head of the Chicago Board of Health, and Captain Daniel A. Gilbert, chief investigator for the Cook County State's Attorney's office.

The second indictment pertained to the ice cream industry. It named National Dairy Products Corp., Borden Co., sixteen other ice cream manufacturers and the International Association of Ice Cream Manufacturers, which has about 400 members in 47 states. This indictment charges the defendants with entering a conspiracy to restrain the use of counter freezers.

Specifically, the milk indictment charged the defendants with conspiring since January, 1935:

"To fix, control and maintain artificial and non-competitive prices to be paid producers by distributors for milk produced in Illinois, Wisconsin, Michigan and Indiana.

"To fix and maintain, by common and concerted action, uniform, arbitrary and non-competitive retail prices for milk distributed in the City of Chicago."

"To hinder and prevent" prospective independent distributors from engaging in business in Chicago "except by methods and manner determined by the defendants."

"To restrict, limit and control and to restrain and obstruct the supply of fluid milk moving into the channels of interstate commerce" into Chicago from the above named states.

The ice cream indictment accused the defendants of "combining and conspiring since January, 1929, to restrain the manufacture and sale of ice cream by restrictive sale and transportation in interstate commerce of counter freezers."

WOOL FROM MILK

Perhaps the manufacture of textiles from casein will provide an important outlet for surplus skim milk in future years. Stephen P. Gould and Earl O. Whittier of the Bureau of Dairy Industry have completed the first steps toward the development of a process for making synthetic fiber from casein by a process which differs from those in use abroad. The casein, softened in water, is dissolved in caustic alkali and carefully worked into the desired consistency by aging the addition of modifying agents and dilution. The prepared mass is forced through spinnerets and the fibers hardened in an acid bath containing formaldehyde and modifiers. A sample of the milk wool is shown here.

Supreme Court Decides Shredded Wheat Issue

National Biscuit Co. does not have exclusive right to the name "shredded wheat" nor to the pillow-shaped form in which it manufactures the product. Such is the ruling of the Supreme Court, in a decision handed down by Justice Brandeis on Nov. 14. Shredded wheat is a generic name by which a "biscuit in pillow-shaped form is generally known to the public," the decision said. Consequently, National Biscuit Co. could not, as it had sought, prevent Kellogg Co. from selling breakfast food under the name of shredded wheat and in the pillow-shaped form.

Justice Brandeis said that the shredded wheat basic patent, issued in 1895, expired in 1912, and other patents pertaining to it soon afterward. There passed to the public on expiration of the patent, he said, not only the right to make the article but to apply the name.

The ruling had no bearing upon the point as to whether the use on the carton of a certain picture was a violation of trademark rights.

For ten years the litigation over shredded wheat has been in the courts, this period being broken once by a two-year truce.

Dextrose Restrictions Seen As Unnecessary

Restrictions connected with the use of dextrose, or refined corn sugar, in food products should be lifted. This was a point made by Dr. C. R. Fellers, chairman of the section on foods and nutrition of the American Public Health Association at the organization's annual meeting in Kansas City recently. A careful review of the properties, present use and hygienic aspects, Dr. Fellers said, "leads to the conclusion that refined dextrose as marketed today in the United States presents no important public health problems. While a few states still require the labeling of some manufactured foods containing dextrose, the wisdom of retaining such regulations seems questionable."

CONVENTIONS

DECEMBER

6– 8—American Society of Refrigerating Engineers, Hotel Commodore, New York.

8– 9—Tri-State Packers, Chalfonte-Haddon Hall, Atlantic City, N. J.

15–16—Northwest Frozen Foods Association, New Washington Hotel, Seattle.

JANUARY

22–27—National Canners Association, Hotel Stevens, Chicago.

23–24—National Preservers Association, Morrison Hotel, Chicago.

Fresh Hawaiian Fruit Can Now Be Imported

Fresh fruits and vegetables may be imported from Hawaii to the mainland under a new ruling by the Department of Agriculture. Effective Nov. 1, the ruling stipulates that the fruits and vegetables be given either a high- or low-temperature treatment before shipment. The low-temperature treatment involves chilling to 35 deg. F. at the center and maintaining at this temperature for fifteen days. The high-temperature treatment consists of heating the product to 110 deg. F. at the center and holding for eight hours.

Experimental work carried out in field stations of the Department of Agriculture revealed that these treatments will destroy immature stages of the Mediterranean fruit fly or the melon fly which had prevented importations from the island previously.

Chain-Store Tax Bill Likely To Be Softened

Modification of the chain-store tax bill is conceded in Washington, even by its sponsors, who confess that as the measure stands it cannot have the support of the trade. Opposition comes from the voluntaries and the cooperatives which are now doing approximately 85 per cent of the business not handled by the corporate chains themselves. These opponents realize that they themselves are vulnerable. If the bill, which penalizes the larger chains, does not prove a material and practical benefit, then the law may prove a legal boomerang, say some of the spokesmen for the cooperatives and voluntaries. It is likely that sponsors of the anti-chain legislation will change their tactics and attempt to "freeze" the interstate chains at their present level.

Brewers Get Together

Appreciating the need for a strong united front to combat any undesirable practices within the industry, to educate the public to the benefits of beer and the brewing business and to neutralize return-to-prohibition propaganda, the different factions in the brewing industry are at last getting together. Brewing Industry, Inc., and American Brewers Association have allied themselves with United Brewers Industrial Foundation. UBIF is sponsored by U. S. Brewers Association and for many months has been attempting to effect a united front in the industry.

To direct its efforts to inform the public as to its real place in the economic and social pictures of the United States, UBIF has named Bernard Lichtenberg public relations counselor.

To Can Navel Orange Juice

Completion of a process for canning navel orange juice is expected to be announced soon by California Fruit Growers' Exchange. Sunkist officials say that experimental packs have approached, if not equaled, the best canned valencia juice.

Research has succeeded finally in isolating the bitter substance of navel oranges and identifying it as a chemical substance (isolimonim) already soluble. It is found in most parts of the navel orange, but is particularly concentrated in the navel formation, which it is therefore desirable to avoid in the extraction of the juice.

About half the California orange acreage produces navel varieties and the season runs from December to May. Since the valencia season runs the other six months, canners may now spread their production over the entire year.

Fluorine Tolerance Up

Effective Nov. 14, the tolerance for fluorine spray residue on fruits was raised from 0.01 to 0.02 grain per pound by the Department of Agriculture. This applies to fruit shipped within the jurisdiction of the Federal Food and Drugs Act.

Research on Freezing

Facts on freezing fish are among recent findings of the British Food Investigation Board. Frozen in brine at a temperature of —4 deg. F. and stored at the same or lower temperature, white fish retain freshness for at least six months. Lemon soles do much better, having been kept in a palatable condition over two years.

CAPITAL VIEWS

NO EXCLUSIVE RIGHTS—Anyone may now make a pillowshaped shredded wheat biscuit and call it by that name. On the expiration of the basic patents "the name Shredded Wheat, as well as the product, process and machinery employed in making it, has been dedicated to the public." Thus speaks Justice Brandeis in a Supreme Court decision. The same principle will presumably apply to other trade names of a generic sort, which describe with fair degree of accuracy the commodity itself. Those choosing names for new products will take notice of this basic limitation imposed on patented commodities and trade names which are to be built up with great advertising expenditures into household terms of importance to the owner.

INTERLOCKING OWNERSHIP—The Interstate Commerce Commission questions whether multiple directorships held by individuals in both stockyards and packing companies are proper. Under official supervision of the agencies for marketing meat animals, the Federal Government is giving attention to this interrelationship of business enterprises. In it and in other business, milk marketing for example, too much integration is looked upon by the government with suspicion. It is just another evidence of the public utility regulation policy with respect to foods.

USE OF DAIRY PRODUCTS—Officials of the Department of Agriculture are giving more attention to the fundamental questions which determine the per capita consumption of dairy products. They note the general uptrend in evaporated milk and cheese use per capita. They are not worried by the swings of ice cream consumption per capita with changing economic conditions, for it is a "luxury." But why does butter consumption per capita not increase along with other indexes of the standard of living? That problem deeply concerns those who have the well-being of the dairy industry at heart. But nobody has yet discovered just what to do about it. Some official experimentation soon would not be surprising.

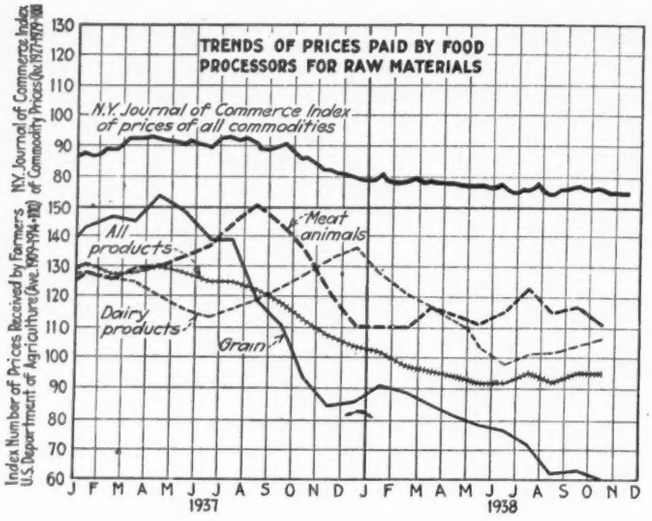
FOOD PRICING—The Federal Trade Commission continues to press on several fronts its campaign to reduce the means available to industry for commodity price control. Some of this work is done under the Robinson-Patman Law, as in the case of Corn Products Refining, charged with discrimination on the basis of delivered prices. Equally vigorous are the attacks on National Biscuit Co., cited under the Trade Commission Law and the Clayton Act with charges of giving arbitrary discounts to middlemen. Equally important to the food industries, though initially directed at other types of enterprise, are cases initiated like that with the ceramic-tile folks. They are charged with varying the discounts between two classes of distributors which are said to be arbitrarily distinguished though actually intercompetitive.

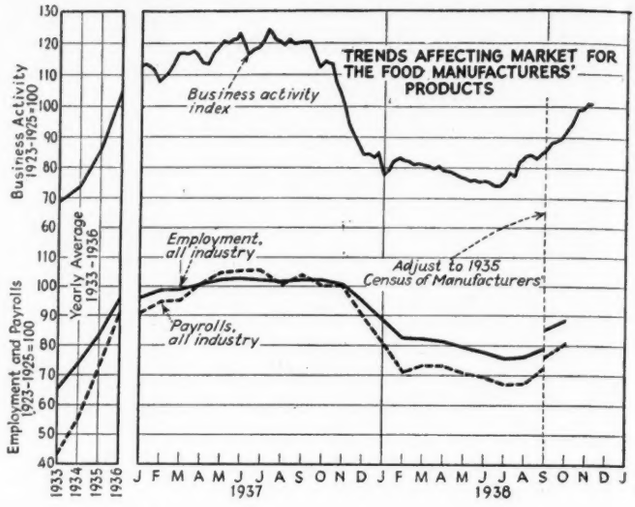
Straight Line Production

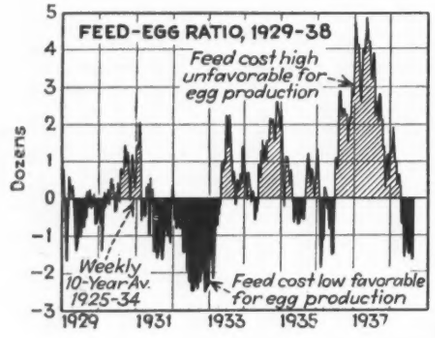
(Continued from page 681)

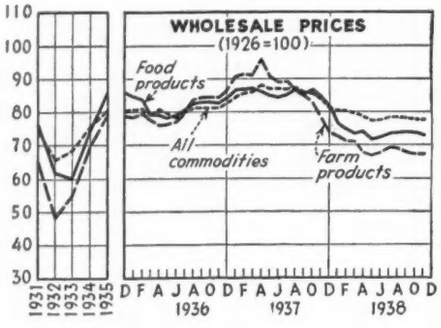
conveyor to be trimmed in preparation for cure. Jowls are trimmed on side tables, as are the shoulders, butts and plates.

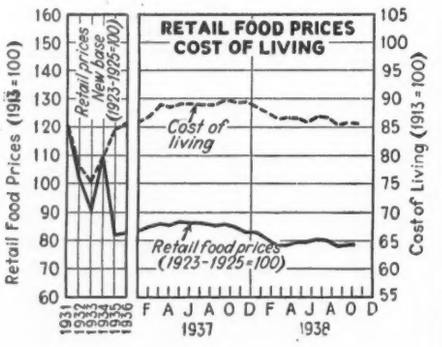
The other production line on the cutting floor is the side table. This is a stainless steel conveyor about 85 ft. long. As the sides reach this table by chute from the balcony, they are passed under a roller to flatten them. Then the spareribs are removed and the sides go under a second roller and through a disk cutter which cuts off the back fat. Then the sides go to men who trim them into breakfast bacon, the trimming being done on cutting boards alongside the conveyor. At the end of the side conveyor, the fat backs and heavy side meats are delivered by gravity to the dry salt cellar and the fancy sides go to another stainless steel conveyor for grading and averaging before being sent to cure or to the freezer.


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of prices of all commodities
All products
Meat animals
Dairy products
Grain
Index Number of Prices Received by Farmers, U.S. Department of Agriculture (Ave. 1909-1914=100)
N.Y. Journal of Commerce Index of Commodity Prices (Ave. 1927-1929=100)
1937
1938




FEED-EGG RATIO, 1929-38
Feed cost high unfavorable for egg production
Weekly 10-Year Av. 1925-34
Feed cost low favorable for egg production
Dozens





Prices received by farmers are from the U. S. Department of Agriculture. Employment, payrolls, wholesale prices and retail prices from the U. S. Department of Labor. The business activity index is that of *Business Week*. The cost of living index is from the National Industrial Conference Board. The data on prices of eggs and poultry feed are from the U. S. Department of Agriculture.

BUSINESS TRENDS

No Definite Movements In Commodity Prices

Marking time while the election passed and its results were being interpreted, food commodity prices swung back and forth within narrow limits during the period from mid-October to mid-November. Wholesale commodity prices of foods, as reported by the U.S. Bureau of Labor Statistics, declined slightly in the four weeks period, from an index number of 73.7 to 72.9. This movement was apparently a continuation of the readjustment following the September war scare, when this price index stood at 75.0 on Sept. 24, the highest figure in recent months.

In contrast, Fisher's index number of commodity prices rose from 80.3 to 80.5 in this four-weeks period, while the Department of Labor's general index number for all commodities fell 0.7 per cent in the same period. It is evident, from the small movement and the disagreement as to direction among the indexes, that there was no marked trend during the month.

Individual food commodity prices exhibited only slight changes over the full two-month period from Sept. 16 to Nov. 14. No. 2, hard winter wheat (Kansas City) fell from 63¾ cents to 62 cents. Flour fell from $4.50 to $4.45. Corn made the greatest movement among the grains, dropping from 54 cents to 45¾ cents. Meat in this two-month period also showed some changes, with beef steady, lamb rising from 15 cents to 17½ cents and pork loins falling from 24 cents to 17½ cents. Lard was also off somewhat, from $8.50 to $7.90. Eggs rose from 26¼ cents to 30 cents, while butter was practically unchanged and cheese rose from 12 cents to 12½ cents. Sugar rose from $3 to $3.10, coffee rose from 7½ cents to 7¾ cents, and cocoa fell from $5.10 to $5.02, showing the same cross-currents in spot prices of the principal imported food commodities. Cottonseed oil was unchanged in this period.

Smaller Crop Yields Is 1939 Expectation

Major crop yields in the United States in 1939 may be expected to be lower than in the growing season just past. Two factors will operate to bring this about. In the first place, carry-overs and surpluses hanging over the market will tend to discourage some marginal planting, so that total acreages in many crops will be lower. The second factor is the acreage allotment plan of AAA, under which farmers who restrict plantings of certain soil-depleting crops receive bonus payments from the government for so doing.

Payments under this so-called soil conservation plan are expected to cut total acreage planted by some 5,000,000 acres from the 1938 figure. National allotments for important crops are: corn, 94,000,000 to 97,000,000 acres; cotton, 27,000,000 to 29,000,000 acres; wheat, 55,000,000 to 60,000,000 acres; rice, 850,000 to 880,000 acres; potatoes, 3,100,000 to 3,300,000 acres; peanuts, 1,550,000 to 1,650,000 acres; and general crops, 145,000,000 to 150,000,000 acres. Most of the actual reduction in acreage allotted comes in wheat, where the most burdensome present surplus exists.

Yields Expected

In recent weeks the Bureau of Agricultural Economics has issued a number

of estimates of prospective yields of various crops in 1939, based on the acreage likely to be harvested and average production per acre. Summaries of some of these estimates follow:

POTATOES—The acreage planted to potatoes in 1939 is expected to be less than in 1938. With average yields on this smaller acreage, production of potatoes in 1939 will be about 310,000,000 bu. This would be about 60,000,000 bu. below the 1927–36 average. Should yields reach 124 bu. per acre (the 1937–38 average), the production of potatoes would be about 350,000,000 bu. In contrast, with yields as low as in 1933, production would be only about 280,000,000 bu.

Outlook for Fruits

APPLES—The number of apple trees of bearing age in the United States has been declining for some years, having decreased 28 per cent in the fifteen years ending in 1935. However, production only decreased 8 per cent in this same period. This slow decrease in apple production is expected to continue for some years more. In any case, apple production varies greatly from year to year. The average of the crops of the last three years was 152,800,000 bu., and this is about what can be expected in 1939 if growing conditions are average.

PEACHES—Production of peaches has been on the increase, and is expected to continue to increase for the next five years. In view of this fact the prospective peach crop, with average growing conditions, should be somewhat larger than the 1933-37 average of 51,000,000 bu.

PEARS—Pear production has been on the increase for about 40 years and this increase is expected to continue. The 1938 crop of 32,000,000 bu. was an all-time high, 7 per cent over 1937 and 20 per cent over the 1933-37 average. With average yield, pear production should continue upward in 1939 as new trees come into bearing.

Construction News

	Pending (thousands)	Awarded Nov. (thousands)	Total Awarded 1938 (thousands)
Bakery	$175	.....	$738
Beverages	405	$80	4,082
Canning and Preserving	40	.....	240
Confectionery	.....	.....	62
Grain Mill Products	40	40	810
Ice Manufactured	.....	.....	360
Meats and Meat Products	350	.....	1,898
Milk Products	.....	83	925
Miscellaneous	1,010	40	4,874
	$2,020	$243	$13,989

Fresh Vegetable Outlook

TOMATOES—A decrease in plantings and in production of tomatoes for the fresh vegetable market is expected in 1939. However, the crop of tomatoes in 1938 was 18 per cent above that of 1937 and 40 per cent over the 1927–36 average. Acreage in 1938 was 223,270 acres and yield in that year was 25,529,000 bu.

SNAP BEANS—Increased acreage is in prospect for the 1939 crop of snap beans for the fresh vegetable market. With average yields, a crop in excess of the 1938 production of 14,608,000 bu. is in prospect.

Outlook for Canning Crops

PEAS—Because of the large crops in 1937 and 1938, resulting in unusually large supplies of canned peas on hand, it is expected that both acreage planted and production of peas for canning and freezing will be smaller in 1939 than in 1938.

CORN—Because of the relatively large outputs of canned corn in 1937 and 1938, plantings for this product in 1939 are expected to decrease to between 305,000 and 325,000 acres, a reduction of 5 to 11 per cent. At an assumed yield of 2.25 tons per acre, a pack for 1939 of 16 to 17 million cases, would result.

TOMATOES—Production of tomatoes for manufacture in 1938 is now estimated at about 1,500,000 tons. This would give a production 24 per cent below 1937, but 8 per cent over the 1927–36 average. Plantings are expected to increase in 1939 by about 18 per cent over 1938, but will still be 3 or 4 per cent below the 1937 figure of 472,900 acres. With an average yield of 4.09 tons per acre, the pack from the 1939 acreage should be around 22 million cases.

SNAP BEANS—The present supply of canned snap beans is the largest on record. Therefore, a reduction in acreage planted to this crop in 1939 of about 25 per cent is expected. This acreage, with normal yield, should give a pack of between 6,500,000 and 7,000,000 cases.

INDICATORS

FLOUR milled in October, 1938, was 6,376,446 bbl., according to reports for mills with about 60 per cent of total U.S. output, as reported by *The Northwestern Miller*. This compared to 6,128,307 bbl. in September, 1937.

FISHERY PRODUCTS held in cold storage on Oct. 15, 1938, totaled 85,233,000 lb., compared to 72,350,000 lb. a year before.

FRUITS, quick frozen and cold packed, in storage on Nov. 1, 1938, totaled 143,601,000 lb., compared to 132,428,000 lb. a year previous and a 1933–37 average for Nov. 1 of 86,741,000 lb.

VEGETABLES, frozen, in storage on Nov. 1, 1938, amounted to 71,288,000 lb. compared to 27,902,000 lb. on Nov. 1, 1937.

BUTTER in storage Nov. 1, 1938, was 193,751,000 lb. compared to 98,624,000 lb. a year before and a 1933–37 average for the date of 119,148,000 lb.

CHEESE, all kinds, in storage on Nov. 1, 1938, amounted to 132,296,000 lb. compared to 112,687,000 lb. on Nov. 1, 1937, and a 1933–37 average for the date of 114,197,000 lb.

EGGS, case equivalent, in storage on Nov. 1, 1938, totaled 5,937,000 cases compared to 8,981,000 cases a year before and a 1933–37 average of 7,394,000 cases on Nov. 1.

POULTRY, frozen, all kinds, in storage on Nov. 1, 1938, was 77,607,000 lb. compared to 76,208,000 lb. a year before and an average for Nov. 1 (1933–37) of 73,456,000 lb.

MEAT, all kinds, in storage and cure, on Nov. 1, 1938, totaled 344,902,000 lb. On Nov. 1, 1937, the total was 354,897,000 lb. and the 1933–37 average for the date was 517,597,000 lb.

LARD in storage, Nov. 1, 1938, amounted to 67,849,000 lb. The figure a year before was 39,477,000 lb. and the 1933–37 Nov. 1 average was 82,828,000 lb.

Business Still Moves Up

Although its upward flight has slowed down somewhat, business continued to gain in the five weeks from October 15 to November 19. With returning confidence strengthened by the election results, even greater progress should come before the year's end. The business activity index of *Business Week*, which stood at 98.6 on October 15, moved up to 102.5 on November 19, a gain of 3.95 per cent.

Encouraging gains were registered in the period by many business indicators. In mid-November steel production stood at 61 per cent of capacity compared to 51.4 per cent on October 15. Automobile production, in the flush period of new model activity, rose to about 90,000 units per week compared to 50,000 a month before. Electric power production continued to increase, moving above 1937 figures. Construction figures were near the 1937 amount, with residential construction holding up well into the late Fall weeks.

The United States Department of Labor indexes of wholesale prices for the five weeks from October 15 to November 19 fell 0.51 per cent for the general index, rose 0.59 per cent for the farm price index, and increased 0.41 per cent for the food price index. The weekly weighted commodity price indexes of the *New York Journal of Commerce*, in the period from October 22 to November 19, increased 0.26 per cent for the general index, fell 2.05 per cent for the grain price index, and rose 1.18 per cent for food price index.

MEN, JOBS and COMPANIES

INDUSTRY

» Allied Mills Co. put into operation on Dec. 1 a soybean processing plant at Omaha, Neb. The plant will have a capacity of 500,000 bu. annually.

» Armour & Co. will spend between $200,000 and $300,000 to improve the plant of Columbus (Ohio) Packing Co.

» Borden Co. will construct at an estimated cost of $50,000 a milk products plant at Bainbridge, N. Y.

» Burger Bros. Co. has been established at Cincinnati as an affiliate of Burger Brewing Co. for the manufacture of malt syrup.

» Canada Dry Bottling Co. of St. Louis has been formed to bottle and distribute Canada Dry beverages in St. Louis and 22 surrounding counties in Missouri and Illinois. The company will be headed by Welch Walker, formerly with W. C. Langley & Co., New York.

» Carnation Milk Co. will build a plant in Statesville, N.C., to be completed early next spring.

» Clarksville (Tenn.) Cocoa-Cola Bottling Co. recently opened a new plant.

» Crispy Crunch Cone Co. has been formed at Birmingham and is operating a plant with a capacity of 1,700 cones per hour. The company will serve the entire state of Alabama.

» Crystal White Salt Co. will build a new $75,000 plant at Salt Lake City next year. The plant will be completed by next summer.

» General Foods Corp., New York, has launched five trawlers within the past fourteen months, these representing a total cost in excess of $1,300,000. This increases to 23 the "College Fleet" of General Seafoods, subsidiary of General Foods.

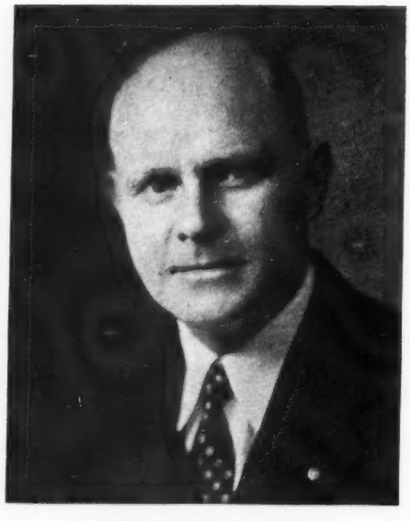
» Great Atlantic & Pacific Tea Co. recently formed a new division with headquarters at Jacksonville, Fla. The old southern division was split into two parts. Robert M. Smith, who had been vice-president in charge of the Jacksonville unit, heads up the new division.

» Holly Sugar Co. has installed at its plant in Torrington, Wyo., eight new high-speed centrifuges.

» Hyde Park Breweries Association, Inc., St. Louis, will construct a four-story reinforced concrete, brick and steel storage house. The company is also building a one-story top addition to the stockhouse.

W. J. BARRITT

International Association of Ice Cream Manufacturers has named him president. He is with Poinsettia Dairy Products, Tampa, Fla. L. E. Hurtz, Fairmont Creamery Co., Omaha, was elected vice-president of the association and E. H. Daniel, Carry Ice Cream Co., Washington, D. C., treasurer.



FRANK F. RENNIE, JR.

He has been named president of International Association of Milk Dealers for the coming year. Mr. Rennie is with the Virginia Dairy Co., Richmond.

» Industrial Sugars Corp. on Nov. 3 announced the acquisition of a site and building for a sugar refinery in Chicago. Recently incorporated under the laws of Delaware and capitalized at $750,000, the company will begin the production of liquid sugars next spring. D. V. Wadsworth, president of Refined Syrups and Sugars, Inc., New York, is chairman of the board of the new firm.

» Isaly Dairy Co. is building at Youngstown, Ohio, a new $400,000 plant.

» Southern Gold Cheese Co., McKenzie, Tenn., has built an addition to its plant and will install a refrigerated department with a capacity of 250,000 lb. of cheese.

» Standard Cereals, Inc., with home offices in Chicago, has acquired six buildings, containing 200,000 sq.ft. of floor space, at Indianapolis. The buildings will be used for the manufacture of a wide variety of corn products. Modern processing machinery is being installed and production is expected to start by Feb. 1. The plant will have an initial daily capacity of 1,000 bu. of corn. The Indianapolis factory formerly was used by the Old American Hominy Co.

» Swift & Co. will build at Columbia, S.C., a modern one-story plant approximately twice the size of its present quarters.

» Viking Baking Co. recently opened at West Hartford, Conn., a new $100,000 plant with 12,000 sq.ft. of floor space. The company does a house-to-house business.

PERSONNEL

» E. W. Brandes has been appointed chairman of the International Society of Sugar Cane Technologists. P. Honig was named vice-chairman and C. W. Edgerton, general secretary.

» Herbert J. Charles, St. Paul, Minn., has been reelected chairman of the United Brewers Industrial Foundation. Carl W. Badenhausen, Newark, N. J., was elected first vice-chairman; S. E. Abrams, Milwaukee, second vice-chairman; Hugh Harley, New York, secretary; and Rudolph Shaefer, Brooklyn, treasurer.

» Frank E. Church, formerly manager of Chicago and Jamaica, N. Y., plants of Grennan Bakeries, Inc., subsidiary of Purity Bakeries Corp., is now president of B. A. Eckhart Milling Co., Chicago. He succeeds Percy B. Eckhart, son of the founder, who has been elected chairman of the board.

» Edward Y. Crossmore has retired as vice-president of National Biscuit Co., New York. He first went with Na-

tional Biscuit at the age of nineteen as a cashier in the Wilkes-Barre, Pa., agency. Following his resignation, Mr. Crossmore's activities in pricing goods were assumed by Vice-president Frank K. Montgomery, and his work in public and labor relations by Vice-president Clyde S. Stilwell.

» WILLIAM J. DAVIS, Manchester, Conn., has been elected president of Connecticut Bakers Association, succeeding C. W. Buckey.

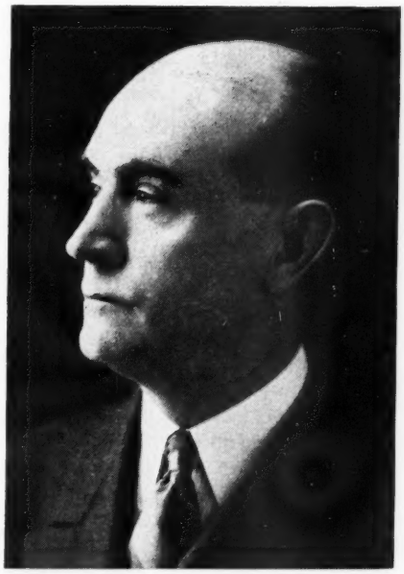
» A. D. DELAHUNT has been appointed vice-president, treasurer and general manager of Goudey Gum Co., Boston, to succeed R. J. Resch.

» BURT V. DICKENS is now a vice-president of National Tea Co. William E. Russell has been named controller and secretary.

» DR. W. F. GEDDES has been appointed professor of the division of agricultural biochemistry at the University of Minnesota. Dr. Geddes had been in charge of the grain research laboratory of the Board of Grain Commissioners for Canada since 1933.

» P. S. GEROT has been appointed Chicago manager of Pillsbury Flour Mills Co., with which he has been for 26 years.

» JAMES M. HILLS resigned on Nov. 3 as president of Grocery Store Products Co., New York, continuing as a member of the board. Mr. Hills plans to give more time to his other business interests.



T. HENRY FOSTER

He has been elected chairman of the board of Institute of American Meat Packers, succeeding Frank A. Hunter. Mr. Foster is president of John Morrell & Co., Ottumwa, Ia. William H. Woods was reelected president of the institute and H. Harold Meyer, president of H. H. Meyer Packing Co., Cincinnati, treasurer and vice-chairman of the board.

» E. G. HOILE, production manager of Kennedy-Mansfield Dairy Co., Madison, Wis., has been named general manager of Westwood Farms Dairy, Inc., Libertyville, Ill., and Winnetka (Ill.) Dairy, Inc.

» GEORGE E. KEISER, vice-president and treasurer of New Niquero Sugar Co., has been elected president of the company, succeeding the late James H. Post. David M. Keiser was appointed to the position vacated by George E. Keiser.

» CHARLES A. LANG has succeeded the late Roy N. Pierson as general purchasing agent and mechanical superintendent for Russell-Miller Milling Co., Minneapolis.

» WALTER S. MACK has been elected president of Pepsi-Cola Co., following a reorganization of the company's board of directors. Mr. Mack is president of Phoenix Securities Corp.

» A. P. OWEN, president of Chambers & Owen, Janesville, heads up the reorganized Wisconsin Confectionery Association.

» H. C. PETERSON has resigned as assistant to the president of Grennan Bakeries, Inc., Chicago. He had been in charge of the company's trade relations activities.

» L. C. STEELE, Fredonia, N. Y., is a vice-president and director of Cudahy Packing Co., having succeeded C. G. Marhoff, who resigned Nov. 1 after 38 years with the company.

DEATHS

» SAMUEL B. BOGERT, 68, vice-president in charge of sales for E. Greenfield Sons, Garden City, N. Y., recently. He had been with the candy company more than 35 years.

» JOSEPH FISCHER, who had been head of Fischer Baking Co., Newark, N. J., for 25 years, Oct. 14.

» HENRY P. GALLAHER, 78, retired president of Northwestern Consolidated Milling Co., Minneapolis, with which he had served for 55 years, at Miami, Fla., Oct. 30.

» JOHN J. GRAVINS, president of Union Abattoir Co., Richmond, Va., Nov. 3.

» W. B. GREEN, JR., 32, manager of Cherokee Farm Products Co., Canton, Ga., recently.

» HENRY C. HACKMAN, 65, former secretary of Belmont Brewing Co., Wheeling, W. Va., Oct. 19.

» JOHN J. NISSEN, 73, president of Nissen Baking Co., Portland, Me., Oct. 23.

» GUY P. NORTON, 56, executive of H. P. Hood & Sons, and for more than 30 years connected with Turner Centre Creamery, at Portland, Me., Oct. 25.

» A. E. PETERSEN, 66, vice-president of Wilson & Co., Oct. 19, at Pacific Palisades, Calif. He had been with Wilson and its preceding organization since 1891.

» ANTHONY SCHREIBER, 74, president of Schreiber Brewing Co., Buffalo, Nov. 8.

» GEORGE M. SMART, 56, former owner of Tennessee River Milling Co., Chattanooga, recently.

ASSOCIATED INDUSTRIES

» ANCHOR HOCKING GLASS CORP. has consolidated all Chicago sales offices and established new quarters in Merchandise Mart, Chicago.

» DAIRY INDUSTRIES SUPPLY ASSOCIATION, INC., is the new name of Dairy & Ice Cream Machinery & Supplies Association, Inc. No change in the activities or objectives of the association accompany its simplification of name.

» INTERNATIONAL HARVESTER CO. has appointed Carroll E. Johnson assistant advertising manager.

» OSBORN MFG. CO. has purchased the assets of Johns Conveyor Corp., Newark, N. J. The Johns conveying device consists essentially of a rubber tube, formed of two separate halves, which moves like an endless belt.

» OWENS-CORNING FIBERGLAS CORP. has been formed by Owens-Illinois Glass Co. and Corning Glass Works. The new company will produce a variety of products from fiber glass, such as air filters.

» READ MACHINERY CO., INC., York, Pa., has appointed Arthur W. Fosdyke as manager of the Chicago office. J. A. Fritz becomes special representative in the Pittsburgh territory.

» CHARLES Q. SHERMAN CORP. announces that Willard H. Randorf has become vice-president in charge of sales. Mr. Randorf had been district manager of Bastion-Blessing Co.

» TRAILER CO. OF AMERICA, Cincinnati, announces the Trailmobile Safety Trophy, which will be presented annually to the motor carrier who is best prepared for safety and to render aid and service to the public on the highways.

» WHITE CONSTRUCTION CO., INC., New York, has appointed Victor Burr contract manager.

Sanitary Floors

(*Continued from page 687*)

mally carried on a concrete base and are seldom satisfactory when placed over wood sub-flooring, or even tamped fill.

Brick or *tile* floors are only a variation of a specially surfaced concrete floor, since they require a base concrete slab for their strength, while the brick or tile are only the wearing surface. The resulting resistance to wear, imperviousness to water, and smoothness are all related to the type of brick or tile used, particularly to the grout or bonding material between and under the tiles. The preferable types of brick or tile are those having a vitreous, non-absorbent body (a vitreous surface on a porous body soon wears out), and in the most used styles are fairly large, or square or rectangular shape. The "dressy" appearance their color and pattern adds to a floor gives relief from the homogeneous, smooth expanse found in the concrete flooring.

The bonding material should be resistant to normal wear and corrosion, so that the joints will not wear out to become catch-alls, or, in the more extreme case, so that the tiles will not be loosened by failure of the bond. Mortar bond is not sturdy; one of the "acid-resisting" cements or mastic bonds should be used.

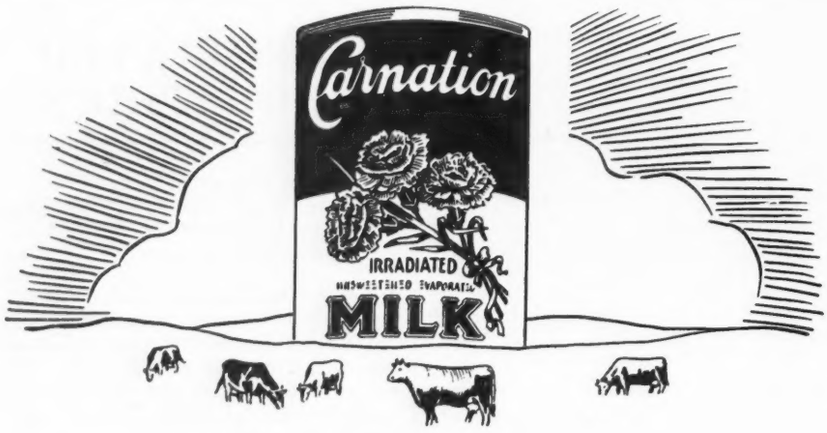
Asphalt, mastic, or *patented surfacings* can be laid in impervious smooth surfaces. Their utility varies with the particular type and quality of the material. Those which have a tar or bitumen base will generally soften with heat, and sometimes tend to show tracks or marks when heavily used. At the same time, these tar or bitumen types can be as easily repaired with heat or readily bonded surfacing. The types of patented surfacing which are in the nature of cement containing special dense surfacing agents are quite satisfactory when the specifications of the manufacturer are carefully followed. Any of these substances, however, are merely surfacings to be placed over a good base slab.

Drainage provision must be arranged at the time of floor installation. All floors that are likely to have water on them should be pitched toward a drain.

If hand trucks must be drawn over the floor, it will be found desirable to make the changes in pitch on the floor very gradual, so that there will be no tendency to upset the truck loadings. Similarly, extremely sharp angles should be prevented around drains because they can cause the workers to slip or fall.

Drains which are placed at the low point on the floor should have three features, namely, removable grids, a satisfactory trap or water seal, and connection to lines of good pitch, made preferably from extra heavy cast iron pipe of not less than 3-in. size.

The maintenance problems are divided into the *repair* of old floors, special *treatment* for those in good repair, and *cleaning* procedure. The most serious problem in concrete floors is cracking or crumbling. Cracks of any origin are difficult to repair. If they are widespread, the most satisfactory cure is to apply an entirely new surface layer of at least an inch in thickness and of the same composition as mentioned under concrete floors. The old floor should be chipped away to at least 1 in. depth, or if the additional height will not interfere a new layer can be laid directly, raising the level an inch or so, after thoroughly cleaning and chipping the old surface to give a good bond.



Maybe The Cows are

CONTENTED

but don't think anybody else is!

While the world-renowned Queen Pieterje Hooghtraaten Carnation III (or something like that) drowses amongst the daisies, thousands toil to place her bounty before the babies of the world, put cream in sailors' coffee, *and do it at a profit.* And there can be no relaxing on this job, no ending to the search for better ways and better equipment.

And this attitude makes Carnation plants logical places in which to find Kemp heating equipment. Here, in the batteries of can-making machines, Kemp Melting (with gas) plays its small but dramatic part in that inspiring industrial opera, "Milkman to the World".

Would you consider your own heating equipment, cookers, ovens, roasters, "good enough" if you could find a better way, a quicker way, a less costly way? If *not,* you'll be interested in details. Address The C. M. Kemp Mfg. Co., 405 East Oliver Street, Baltimore, Maryland.

KEMP of BALTIMORE

Where the repair covers only a small section, it will be satisfactory to chip out the old floor to a depth of about 1 in., with edges perpendicular to the chipped area. The same mix as mentioned in finishing concrete should be placed in the hole and struck off a quarter of an inch or more higher than the surface of the floor. It should then be allowed to rest an hour or two so that the concrete will start to set and most of its initial shrinkage will have occurred. The surface then should be trowelled off to a smooth level. Unless this precaution is taken, the patch will be low in the center and will tend to pull away from the sides. The floor should be cured by a thorough wetting for at least several days.

There are also many patented patching materials on the market which it is claimed will bond satisfactorily even to a feather edge, but their application calls for special procedure. Many of them have been very satisfactory, however.

A less serious fault of concrete, caused by poor installation, is dusting. This may be stopped in a measure by using floor hardening compounds, such as dilute solutions of sodium silicate (1 gal. 43 deg. Baumé plus 4 gal. water) or magnesium fluosilicate (1 to 2 lb. per gallon of water) solutions, which are brushed over the surface. This process requires two or more coats, and each coat must be allowed to dry, followed by thorough scrubbing with water before the next application. This same process is sometimes recommended for new floors, but in general it has been found that where the floor is installed properly finished, this additional surfacing is not altogether necessary.

The repair of brick or tile floors generally requires replacement of broken brick or tiles for moderate damage, or, if the damage is extensive, involving cracks, "blisters," or loss of bonding material, it may be necessary to relay the whole floor.

The mastic or bitumen floors usually can be repaired fairly easily because the material bonds readily with the old floor. The only care necessary is to remove all loose material and either tamp or work in the repair, bringing it to a smooth even surface.

Assuming that the floors in the plant are of good sanitary design and installation, the problem of keeping them clean is relatively simple. There are only a few rules to follow, namely: (1) use a mild cleansing agent which will not attack the floor, (2) use a scrubbing brush and "man-power", (3) rinse thoroughly and "dry down" each time.

There are numerous types of cleaning agents on the market, some of them of the soap type, others of mild detergent action. Most of them are intended to be used in conjunction with a stiff brush and a definite amount of scrubbing, for vigorous brushing is very necessary to actually move attached dirt or other foreign material. After cleaning, the floors should be thoroughly rinsed. Cleaners that merely need to be sprinkled on the floor and then washed off are often found to be active enough to damage the floor surface.

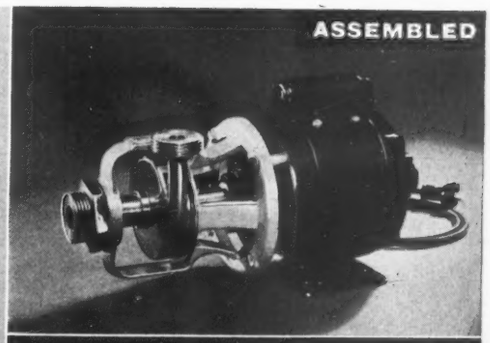
The use of mops on sanitary floors is entirely out of the question, because mops usually contribute as much dirt as they remove. The use of brushes with ample rinse water, followed by the rubber squeegee, will accomplish far more satisfactory results. Notice, however, that the rubber wiper cannot be used on rough, uneven surfaces, which, of course, have no place in a sanitary floor.

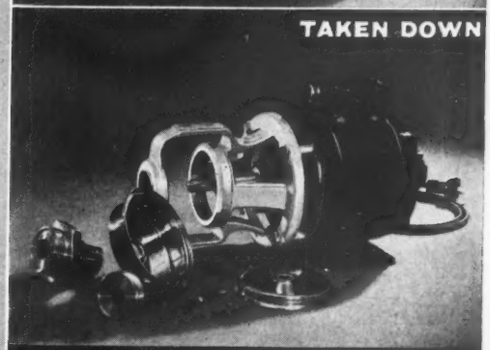
CHERRY-BURRELL rang the bell at Cleveland with its new line of Stainless Steel FLEXFLO Pumps. The entire milk casing is of rolled, polished stainless steel . . . *pressed* instead of cast . . . and in two parts, with paper seal gasket, for "take down" convenience.

Casings are mounted direct on the standard, splash-proof, ball-bearing motors—no bearings in the casings—no outboard bearings—no base plates—four sizes—capacities 2,000 to 100,000 pounds per hour.

Oh yes — the present standard line of DiaMonD Metal FLEXFLO Pumps is retained.

Ask your Cherry-Burrell representative about the new stainless steel Flexflo. They're new — and they're sanitary!





STAINLESS FLEXFLO PUMPS ARE SANITARY

The Package Must Talk

(*Continued from page 694*)

sumers who have tried them. But never has there been so much enthusiasm, so much acclaim, for an industry which represents so small a portion of the total market. Excluding ice cream, considerably less than 1 per cent of all retail foods are now sold frozen. The reaction of this small portion on the rest of the market is therefore the more surprising.

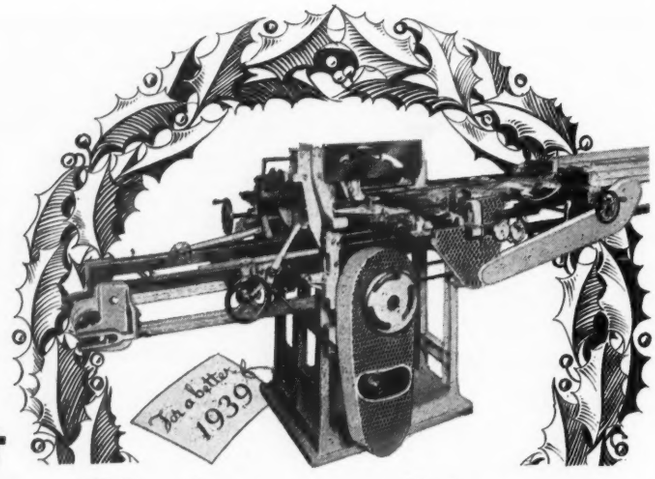
Frozen foods have made unwitting partners of competing industries—still competing, but nevertheless allied. Frozen foods have brought innovations into the food processing industry. Frozen foods have also brought about some startling changes in the field of distribution. Old-line dry grocery wholesalers are now selling complete lines of perishable foods—fruits, vegetables, meat, poultry and fish—all of them frozen, all of them packaged. Fresh fruit and vegetable dealers are distributing, in addition to their regular line, meat, fish and poultry. Food manufacturers are entering actively in the field of distribution, distributing direct to retailers a varied line of food products, many of them not of their own production. The ice cream manufacturer distributing frozen foods is one of these. It is not at all improbable that some of the meat packers, excepting those affected by the consent decree, will distribute frozen fruits, vegetables, poultry and fish, as well as their own products, both fresh and frozen. Are these facts not significant as heralding new trends, great changes in the distribution of food?

Yesterday was the day of specialization, specialization in every field including food distribution. Whatever the situation of the specialist and his activities in other fields of endeavor, the economic pressure to reduce the cost of distribution, centering as it does in the food field, is directing a trend toward larger units, distributing a greater range of food products. This consolidation movement is not only *possible* because of, but *augmented* by the present-day system of packaging. The supermarket is evidence of this trend in retail distribution.

The frozen food industry has expanded because it has offered packaged quality products. The future expansion of frozen foods depends, unfortunately, not alone on the quality of products, nor on the package, but also on other influences which might well be termed "balancing factors."

Greatest progress is made during periods of adversity. The canning industry, which has had fairly smooth sailing with little adversity for many years, may be expected to make great forward strides in the face of the growing competition of frozen foods. There is evidence to support the belief that the art of canning will progress and improve, narrowing the gap in flavor and quality, at least between canned fruits and vegetables and fresh or frozen fruits and vegetables. Already, the balancing factors are operating in fresh produce. In some parts of the country fresh vegetables are reaching the consumer as ready and well prepared for cooking as are frozen foods. Fresh peas and lima beans shelled, washed, graded, weighed or measured are reaching the market in consumer packages with transparent tops, which permit inspection before purchase.

No estimate of the future of frozen foods, nor for that matter of other foods, can be dependable which does



It's not on your Christmas List . . .

BUT it should be in your New Year's plans

Problem No. 1 of most manufacturers is to find a way to lower costs, so that they can look forward to a more prosperous new year.

No doubt many of your costs cannot be lowered, but it is just possible that some *can.* Packaging, for instance—modern packaging machinery far outclasses former machines and methods. In recent years there have been more new developments and improvements than in any preceding period. The result is that much of the equipment being used today is actually obsolete by comparison.

Definite Savings

Our new machines work at far higher speeds, making large savings in time and labor costs.

They are extremely flexible—quickly adjustable for many sizes, shapes and types of products. This means that a manufacturer, who could not afford to use extensive multiple equipment, may now use a single machine to handle his entire line. Moreover, in a large plant high speed adjustable machines save considerable floor space as fewer machines are required to do the same amount of work. Striking savings are also being made in wrapping material costs.

Lower in Price

On top of all these advantages and economies, our new wrapping machines actually cost less today than they ever have before.

Particularly at this time, our wide experience can be of value to you in spotting obsolescence in your plant . . . and in bringing about new savings and higher efficiency.

Ask our nearest office how we can help you.

Write for Booklet "How Packaging Costs are being Lowered"

PACKAGE MACHINERY COMPANY, Springfield, Massachusetts

NEW YORK CHICAGO CLEVELAND LOS ANGELES

Peterborough, England: Baker Perkins Ltd. Melbourne, Australia: Baker Perkins Pty., Ltd.
Mexico, D. F., Apartado 2303 Buenos Aires, Argentina: David H. Orton, Maipu 231

PACKAGE MACHINERY COMPANY

Over a Quarter Billion Packages per day are wrapped on our Machines

not calculate the effect of balancing factors, the future of some of which are as unpredictable as the future of frozen foods. One of these unpredictables is the new locker plant system. These plants were developed to provide a place in which the individual could store frozen foods, usually produced by his own labor or at least purchased at wholesale. Farmers were the first users of these locker plants. Today, however, plants are operated successfully which cater to city dwellers in urban centers of more than 100,000 population.

There are two other things, relative to the locker plant, which are important: (1) Each locker renter is a convert to frozen foods. And in Iowa somewhere between 20 and 30 per cent of the rural families are locker renters—about one-fourth of the families of each community where there are locker plants. (2) Each locker user is accustomed to prepackaged fresh meat, fowl, fish, fruits and vegetables, weight and character of content stamped on the outside of the package.

Food industry competition is *between* the food industries rather than *with* non-food industries.

Per capita consumption is increasing in packaged foods, decreasing in those sold as bulk food.

The trend of retail distribution is toward the combination grocery store. Most successful combination stores, both from the standpoint of increasing volume and enhanced acceptance, are the large self-service stores. In these stores each food product has new and intensified competition, with the odds in favor of packaged products.

There is today a much recognized and admitted pressure, resulting from the concerted endeavors of politicians, and that body politic, the consumer, for lowered cost of distribution. Where lower distribution costs have been effected, packaged merchandise has helped lower the cost.

Those serving in the wholesale function are diversifying and rounding out their line, to cover a greater range of fresh and staple products. It is packaged items they are adding.

Some manufacturers are going direct to retailers, others will, barring legislative interferences, with a diversified group of products not of their own manufacture, packaged products.

The canning industry is certain to improve its products and its packages.

There is a trend toward packaging fresh fruits and vegetables in consumer packages.

Fish, packaged fish, both fresh and frozen, is in new competition with other foods at the point of sale.

Locker plants have introduced a new form of distribution; the effect of this new industry may be far-reaching indeed. Locker plants are creating a strong acceptance for frozen foods and each item in the locker plant is packaged.

Is any more evidence needed to indicate the importance of packaging in the new scheme of distribution? And what a grave responsibility this places on the package—the package, which only too often is the only contact between the producer and his customers—in a day when there is such lack of understanding—such need for sound public relations.

How your package must talk—only you can make it talk—and make it you must, remembering that as more items are packaged and as each is better packaged, your package must talk fast and with conviction in the few seconds it has to sell.

Just Published!

A NEW CHECK LIST OF FOOD PROCESSING EQUIPMENT

- gives you latest information on new mixing equipment design in the food field
- shows you how to use modern machines for profit
- a convenient buying guide that may save you time and money

If you are a production executive in a food plant, we want you to have one of our beautiful new 56-page mixer catalogs without cost. No matter how large or small your operations may be, you will find it to your advantage to look through this book and inspect the splendid equipment which it presents. You may find just the machine you've been looking for to speed up your production without increasing your costs — or to maintain present production at less expense. Size 8½ x 11, containing 133 illustrations and 56 pages, bound in attractive leatherette cover — a definite must for every production man's desk. Send for your copy TODAY while the supply lasts.

FREE TO YOU! If you act now

CLIP COUPON—PASTE ON 1¢ POSTCARD

ROBINSON MFG. CO., MUNCY, PA.

Gentlemen: Without cost or obligation, please send me at once your new 56-page mixer catalog No. 32-E describing the Robinson line of mixing equipment.

Name ..... Position .....

Company .....

Street ..... City and State .....

Federal Food Law

(Continued from p. 689)

deteriorating drugs. The Act provides the procedure to be followed in the promulgation of these regulations.

It also makes ample provision for judicial review of them in order to guard against capricious, unreasonable, and arbitrary action. Whether this was necessary in the light of recourse to the courts otherwise available is of no particular importance. Certainly opportunity for a full and fair judicial review should be accorded. In the enforcement of this law the government has no occasion for resort to improper procedure or to make unfounded decisions. Commercial agencies regulated by the law are entitled to statutory guarantees that the authority conferred for effective enforcement will not be abused. These conclusions, it seems to me, are self-evident when it is recognized that by the terms of the statute the findings of the Secretary as to the facts are conclusive if supported by substantial evidence.

In brief, the special regulation-making power which the Food, Drug, and Cosmetic Act has conferred provides a certain flexibility. This is essential to deal adequately with the innumerable shifting, technical and complex problems presented by the vast amount and variety of products to which the law relates. Perhaps such problems can be handled in no other way. In authorizing the government by these means to function with respect to many of them there will be a projection of administrative activities into a sphere totally different for the most part from that in which it has been operating under the old law. However, proper adjustment will not lag. It has substantially occurred already under those sections currently effective. Advance general regulations under such sections were promptly issued. Tentative regulations on the remaining sections have been drafted and a departmental announcement has issued calling for a hearing on these general regulations on Nov. 17. While such hearing is not required it is our purpose to hold it.

Included in those provisions which became effective upon approval of the Act is the authorization to hold hearings and promulgate regulations to become effective on or after the effective date of the Act. This enabled the Department to proceed without delay to a consideration of means by which food standards should be formulated. As you know, a Food Standards Committee of six members has been appointed—two from this Association, two from the Association of Official Agricultural Chemists, and two from the Food and Drug Administration. This committee will convene for the first time in Washington on Nov. 7. Meanwhile the subject matter files on various food products, which the Administration has been accumulating for years, have been under a joint scientific and legal review to determine whether they contain that "substantial evidence" requisite for the support of such standards as the committee may draft. Where considered deficient the Administration undertook, principally through field stations, the procurement of authentic data for their completion. In this program seasonal products were for obvious reasons given preference.

The task of preparing standards of identity and quality for the great range of food products, with the revision of them as circumstances require, is both a huge and a never-ending one. The committee will be expected, as the old committee on advisory standards did, to propose tentative standards. This will be done after a consideration of the information on hand and such additional facts derived from trade, public, or other sources as the committee finds necessary for its purpose. To what extent conferences and consultation with consumer and industrial groups may be required, and in what manner effected, will be left to the committee's own determination. But the hearing which the Secretary must hold in advance of promulgating final standards is one which, in my judgment, will not be held by the committee but by an examiner designated by the Secretary. It may be inadvisable to discuss this feature prior to the issuance of rules by the Department for holding such hearings. It is, however, appropriate now to call attention to the differences between a hearing characterized by a more or less informal discussion and interchange of views in which expressions of opinion predominate, and one of a more formal nature at which an atmosphere comparable to proceedings in court should obtain and where, through the testimony of members of the standards committee or officials assigned to it, and spokesmen for producers and consumers, a record of facts is prepared for certification, in the event of litigation, to the Circuit Court of Appeals.

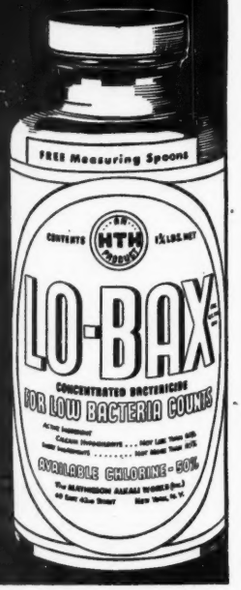
At this juncture no one can say with finality the various respects in which administrative precautions must be exercised—having regard for both substance and procedure—if the regulation in the face of controversial litigation is to be upheld as valid. This is perhaps impossible in advance of guiding court decisions. The statute is itself among those which represent pioneering legislation on administrative law. But it can be said now and unhesitatingly that the changes involved in administrative outlook, in administrative operations and the consequences thereof under the new law as compared with the old, are so great as to be almost revolutionary. This is true particularly in the matter of promulgating those special regulations of substantive significance.

I appreciate the lamentable limitations of these comments. Before Departmental administrative commitments are made through regulations or otherwise, any attempt to depict the opportunities and difficulties attending the enforcement of the Food, Drug and Cosmetic Act will inevitably be unsatisfactory, because one must adhere too strictly to the letter of the law and limit himself to an appraisal conjecturally of the possibilities under it. The subject is one which can be more profitably discussed two or three years hence. All that with propriety may be said now, trite or platitudinous as it sounds, is that the degree to which administrative functioning will realize on the possibilities offered by the new law for the suppression of abuses in the production and marketing of foods, drugs, devices, and cosmetics will be in direct proportion to the facilities provided; that, in recognition of the importance which the law ascribes to findings of facts by the administrator, it will be our purpose to procure all facts practicable from whatever sources available and to deal with them fairly when acquired; that we purpose a continuation and, where possible an extension of the program of cooperation with state and municipal officials. Finally, the law was enacted for the protection of consumers. In its enforcement we shall proceed on that premise, but without prejudice to an intent to deal equitably and, I hope, civilly with all parties.

SAFEGUARD YOUR PRODUCTS!

CHECK THESE SIX LO-BAX FACTS

1. KILLS BACTERIA QUICKLY
2. DISSOLVES QUICKLY—MAKES CLEAR DAIRY RINSE SOLUTIONS
3. CONTAINS 50% AVAILABLE CHLORINE
4. DOES NOT LOSE ITS STRENGTH
5. EFFECTIVE HOT OR COLD
6. EASY TO USE, LOW IN COST



SPOILAGE losses from bacterial contamination will take an enormous toll of profits in many food plants during 1938. Have you taken steps to safeguard *your* products by means of a rigid sanitary routine coupled with a dependable, quick-acting sterilizer like Lo-Bax? This convenient germ-killer is so economical that you can use it everywhere—on equipment, containers, floors, walls, ceilings. Write us for full information.

The MATHIESON ALKALI WORKS *(Inc.)*
60 East 42nd Street New York, N. Y.
Pioneer Manufacturers of Chlorine Products for Over Forty Years

Seniority Is Not Simple

(*Continued from page 672*)

these questions are being answerd.

In plants having steady employment and low turnover of labor, seniority often starts the day a man is hired, accrues one day at a time and lapses only at his permanent dismissal.

In plants having some steady employment and some seasonal surges, seniority may not start until a man has survived a seasonal labor layoff, or may start a month, or even a year, after he is hired. It may accrue, in a monthly or yearly increments, and lapse after a layoff of one month or six months or any period which indicates that the man has been transferred to seasonal labor status. These plants intend to give steady workers all the benefits of seniority, but endeavor to avoid adding seniority factors to the already complex problems of seasonal labor.

In departments where skills take a long time to acquire, seniority may start the day a man is hired, but accrue by yearly increments or by other time periods which are long enough so that passing through one will develop a measurable increase in skill.

In plants where practically the whole working force is laid off seasonally, seniority may accrue by yearly increments, but lapse if the senior fails to report for work within two days after he is called back.

There is a knotty question as to whether or not seniority requires juniors. For instance, does the option of a senior to refuse overtime apply automatically with his accrual of time increments or does it apply only if there is a junior capable of taking over the extra hours? Likewise, do other options accrue automatically with time increments or only when there are juniors below the seniors?

The effect of automatic increments on the total wage bill can be considerable. Likewise, a plant can find itself giving first claim on jobs to more older men than there are jobs for older men to fill, while its ability to employ needed younger men is curtailed.

The problems of seniority are too varied and complex for rigid plans. There must be flexibilities, compensations, means of adjustment. In one plan, adjustments are made by having such options as those of promotion, right to learn new skills, and so on, apply only if such things as knowledge, training, ability to learn, present skill, efficiency record, physical fitness and residence are all equal. The better qualified junior, then, can jump over his senior to a better job, but the senior loses none of his other options.

In another plan, the management has the option of shifting a senior of impaired efficiency to new work at lower pay, but the senior loses none of his other options.

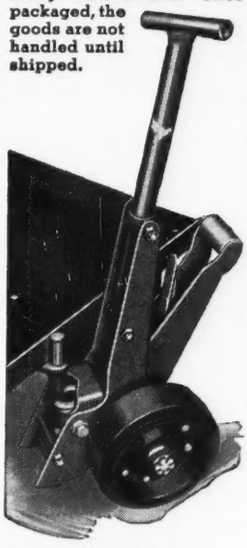
Perhaps the best plan of adjustments is the one in which a really working industrial relations council has the final say. Such a council, having representatives of the seniors, the juniors, the management and the union, if there is any in the picture, can work wonders.

Many plants have "unwritten" seniority systems based on common sense, humanity and honesty. Those plans can be the best ones. But they are frowned upon by high authorities and they do not always keep abreast of the modernization taking place in the rest of the management policies.

Thorough planning is the only safe handling for seniority. And forced plans may be costly.

Mobilize HANDLING!

A row of loaded Colson Lift Jack platforms stacked with bulky merchandise. Once packaged, the goods are not handled until shipped.



BAGS, barrels, boxes, odd-shaped loads or what have you—all can be transported the mobile way with Colson Lift Jacks and Platforms. No extra pick-ups...no extra set downs...no extra handling. Goods can be moved at minimum cost.

Two simple units do the trick:

1. A platform or live skid with wheels on one end and legs on the other.

2. A twin-wheeled jack that engages the front end of the platform and converts it into a sturdy and easy-to-roll truck.

Multiply these units by the requirements of your plant and your materials are always completely mobile, while taking up but little or no more floor space than the area of the load.

Inexpensive, too

A very small investment will start this system for you. $150 will buy a lift jack and several platforms—no other equipment is needed. A Colson representative will gladly study your material handling requirements and show you how the Colson system saves money.

SEND FOR FREE BOOKLET

The essential facts of Colson Lift Jacks are explained in the booklet: "Colson System of Materials Handling." Write for a copy.

THE COLSON CORPORATION
3718 CEDAR STREET • ELYRIA, OHIO

COLSON LIFT JACK SYSTEM

(*Continued from page 701*)

ably many factors are responsible for this defect. Three things are quite important: lack of acid development, due to poor starter or cool temperatures; low salt content; large sized loaves, which naturally absorb less salt. Heavier salting is sometimes useful in preventing it.

Digest from "Observations on the Splitting of Brick Cheese," by F. E. Hanson, D. W. Spicer and W. V. Price, *Journal of Dairy Science*, 21, 433, 1938.

DEHYDRATED FOODS

Dried Potatoes

AN IMPROVED METHOD of drying potatoes to give a dried product with superior keeping qualities, and a by-product suitable for stock feed, is disclosed in German Patent 658,146 (granted March 23, 1938, to Walter Koeniger, Berlin). After peeling the potatoes and removing all eyes, the enzymes which would hasten spoliage are destroyed by blanching or exposing the potatoes to hot (boiling) salted water. The treated pieces are then dried in a hot air drier to give a stable dried product. The peelings and eyes are comminuted, pressed to recover the remaining juice, and the press residue is dried on a roll drier. This material is a useful by-product because it can be incorporated in stock feeds.

FRESH PRODUCE

Fruit and Vegetable Storage

COLD STORAGE will preserve fresh fruits and vegetables simply by inhibiting those autolytic process (whether of ripening or decay) which lead to spoilage, much of the effect being gained by halting the growth of microorganisms. But fruits and vegetables are living systems, with a delicate balance to maintain, and losses in storage are easily incurred. Frequently the cause goes far back of the storage room to injury by hail, by animal attack, or by carelessness in harvesting and transporting the product. The causes of loss and spoilage of sound, whole fruits and vegetables are, nevertheless, subject to some control in the storage room.

A certain amount of weight loss is unavoidable because it is essential to the respiration and life processes of the stored products; but excessive drying out can be avoided by providing the optimum in humidity as well as in temperature. Freezing, or the severe dehydration observed in freezing spinach, must be avoided, bearing in mind that each fruit or vegetable has its own sensitivity, its own temperature at which physiological low-temperature injury lowers quality or causes actual spoilage. So also with humidity. Drying out must be minimized yet such a high humidity as to encourage bacterial growth must be avoided.

Even the composition of the air is important because respiration at this stage in plant life evolves carbon dioxide, which must not be allowed to accumulate to a harmful concentration. Infection of stored products by air-born spores must be prevented, and no objectionable odors should be permitted in the atmosphere because odors are readily absorbed. Lemons are old offenders, disseminating their odor to all their surroundings. Skill and care give excellent results, but neglect may bring seemingly disproportionate losses.

Digest from "Losses in Cold Storage of Fruits and Vegetables," by N. Nicolaisen and L. Scupin, *Vorratspflege und Lebensmittelforschung* 1, 44, 1938. (Published in Germany.)

MEAT & FISH

Fish Not Injured by Placer Mine Tailings

A CAREFUL SURVEY of the Rogue River in Oregon showed that, despite popular belief to the contrary, fish life of the salmonoid type was not injured by the muddy waters resulting from placer mining operations. On the contrary, the mud helps the fish to escape capture. Frequently, natural erosion creates muddier water than placer mining.

From, "Placer Mining on the Rogue River, Oregon, in Its Relation to the Fish and Fishing in That Stream," by H. B. Ward. Bulletin No. 10, State of Oregon, Department of Geology and Mineral Industries.

Preserving Meat Preparations

MEAT prepared for sausage, sandwich spread or meat loaf is preserved, and at the same time improved in flavor, by addition of aromatic bitters extracted from leaves, roots, bark, seeds, peel or other parts of such plants as gentian, licorice, dandelion, snakeroot, cusparia, cardamon and the like. Specifically, the use of "Angostura" bitters is contemplated, for example 2 fluid ounces to 100 lb. of meat. As the invention is described in British Patent 486,165 (granted Aug. 25, 1938, to H. G. C. Fairweather for Angostura-Wuppermann Corp., Norwalk, Conn.) the meat is first cured, e.g., with a composition of nitrate, salt and sugar, then chopped or ground with or without spices such as cinnamon, clove or nutmeg. The aromatic bitters are incorporated with the prepared meat either during or after grinding.

STARCH

Preventing Discoloration In Potatoes

THE DARKENING of potatoes in air is a serious source of loss and trouble in the manufacture of potato starch, potato flour and dried potato products. Contributing factors include exposure to heat, damage to whole cells so that exposure to air is increased, and contamination with iron (from tools or containers) and other substances which accelerate the discoloration. Not content with relying on eternal vigilance for protection of potatoes during handling and processing, the Kaiser-Wilhelm-Institut for Research in Plant Breeding, at Müncheberg, made a systematic effort to obtain a potato plant that will yield potatoes with partial or complete immunity to the dark discoloration observed in potatoes as now cultivated. The goal has not been reached, but results have been obtained which show much promise of success. The experiments have not been limited to cultivated varieties, but have included cross-breeding with wild potatoes.

Digest from "Darkening in Potatoes; Breeding and Utilizing Non-darkening Potatoes," by H. Schmalfuss, G. Stelzner and W. Kröner, *Vorratspflege und Lebensmittelforschung* 1, 222, 1938 (Published in Germany)).

MISCELLANEOUS

Carob Bean Products

SUGAR, MOLASSES, TANNINS AND PECTINS are obtained from macerated carob beans by aqueous extraction and treatment with alkaline earth carbonates. As the invention is described in British Patent 477,312 (granted Jan. 27, 1938 to Jose Antich and Fernando Blanes, Spain), the extract, after adding calcium carbonate (or barium carbonate), is filtered and the filtrate is treated by customary sugar refining methods. Crystalline sucrose and molasses are the products of this treatment. The refining operations include treating the filtrate with lime, heating, filtering off the precipitate and carbonating, or treating with calcium carbonate instead of with lime, then heating and filtering.

57th Street Construction

(*Continued from page 683*)

This new building material was employed in the walls between the processing room and the reception and bottle washing rooms. Also large vertical panels of it were built into the outside wall of the processing room. This building material has several advantages. Entirely aside from its pleasing architectural effects, the glass brick, being hollow, insulates against heat and sound from the outside. Then it eliminates the painting of window sashes and replacement of panes.

Dairy plants have had high maintenance costs in chill boxes for many years because of the moist condition which rotted the ceiling beams and caused them to collapse. In the old type ceilings the supporting beams were filled in between with ground-cork insulation. Inside this type of ceiling there existed a temperature gradient which set up a dew point temperature about midway of the insulation. This condensed moisture on the beams, rotting them. This difficulty has been overcome at 57th St. by a different type of chill-box construction, shown in the accompanying drawing. As may be seen from the figure, the insulation is suspended from the ceiling and the supporting beams are left open so that air circulation keeps them dry.

The third prime requisite of the new building at 57th St., adaptability to future changes in plant equipment, was necessitated by the constantly changing conditions in the milk industry. To facilitate the installation of larger and heavier equipment as improvements in design make it advisable, wide column spacing was employed, averaging about 25x25 ft. Then the floor drains were placed close to the columns instead of in the center of the bays as in conventional building design. This makes it possible to place large pieces of equipment in the center of the bays without relocating floor drains. Location of the floor drains next to the columns has another important advantage in that it is not necessary to extend the drain pipe under the floor or across the ceiling below. In the Sheffield plant, the pipe extends up the columns and connects directly to the drains, thus eliminating the location of floor drain traps above any piece of equipment. Furthermore, empty floor sleeves were provided at columns throughout the plant. These sleeves will permit the installation of additional pipe without cutting holes in the floors and then waterproofing them. As another precaution, all electrical power panels were located on permanent stair walls or shaft walls so that they would not have to be relocated should any minor building change be required. To permit easy installation of new equipment wide doors and two elevators of 20,000-lb. capacity were provided.

To keep the vertical piping within the column lines, the flanges of the floor beams were notched, and the pipe set into the notches. In the garage areas, the vertical pipes are encased in concrete to a height of 8 ft., and the concrete, in turn, is inclosed in steel boiler plate, or armor. This collision-proof casing is rounded so that there are no sharp corners to damage the body of a truck.

While the 57th St. structure was built for fluid-milk operations, the principles which dictated its design and the materials selected for its construction can be applied to other food plants to effect low maintenance expense, easy cleaning, good sanitation and flexibility for future changes in operations and equipment.

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These
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BOOKS RECEIVED

CHEMICAL ENGINEERING CATALOG 1938. Published by Reinhold Publishing Corp., 330 West 42d St., New York, N. Y., 1,034 pages; 8¾x11¼ in.; cloth. Free to responsible persons in the process industries on an exchange basis; for permanent possession the charge is $3.

This buyers guide of the chemical processing industries appears in its 23rd annual edition with a new feature, a 16-page section devoted to nomographs and charts presenting technical data. These pertain to dewpoint and moisture content, flow of steam through pipes, boiling points of solvents under vacuum, conversion table for vacuum and temperature, capacity of cylindrical vessels and standard dished heads; heat transfer coefficients, linear expansion of pipe and similar subjects.

The catalog contains the customary alphabetical index of firms whose products are catalogued, together with a trade name index which enables the buyer to obtain the name and address of the manufacturer of a product of which only the trade name is known. In the equipment and supplies section appear, in addition to the technical data section mentioned, a classified index of equipment and supplies followed by 745 pages of manufacturers catalogs listing, describing and illustrating equipment for the industry. The chemicals and raw materials section is arranged after the pattern of the equipment section, with classified indexes of industrial and laboratory chemicals and 72 pages of chemical manufacturers catalogs. A list of technical and scientific books, said to constitute the most complete bibliography of chemical technology in existence, is included in the catalog.

HANDBOOK OF INDUSTRIAL FABRICS, SECOND EDITION. By George B. Haven, Massachusetts Institute of Technology. Published by Wellington Sears Co., 65 Worth St., New York, N. Y., 1938. 698 pages; 6x8 in.; cloth. Price, $2.

Useful to purchasing agents and engineers in the food industries will be this reference volume on industrial fabrics. The task of selecting the best fabric for the purpose, including materials such as those used in uniforms, filters and conveyors, will be made easier by the knowledge presented in these pages.

In the book are discussed the types of cotton, the manufacturing processes for cotton fiber, uses and properties of industrial fabrics, laboratory design and practice, and specifications and test methods.

PATENTS

Coffee, Cocoa Beans, Peanuts Roasted in a Continuous Manner With Stream of Heated Gas Moving Through Roasting Compartment in Continuous Manner—William G. Burns, to Jabez Burns & Sons, Inc. New York, N. Y. No. 2,129,673. Sept. 13, 1938.

Meat Products Cased in a Perforated Liner Sealed With an Overlying Coating Made From Water, Gelatin and an Edible Fat and an Outer Covering—Henry Carl Eckrich and Herman J. Eckrich, Sr., Fort Wayne, Ind. to Peter Eckrich & Sons Inc., Kalamazoo, Mich. No. 2,129,832. Sept. 13, 1938.

Fondant-Like Confection Made From Anhydrous Dextrose—Carl S. Miner, Chicago, Ill. to Corn Products Refining Co., New York, N. Y. No. 2,129,859. Sept. 13, 1938.

Dextrose Crystallized by a Two-Step Method—William B. Newkirk, Western Springs, Ill. to Corn Products Refining Co., New York, N. Y. No. 2,129,864. Sept. 13, 1938.

Bon-Bon-Type Coating for Ice Cream Bars—Adolf Anton Schildberger, to Corn Products Refining Co., New York, N. Y. No. 2,129,881. Sept. 13, 1938.

Glucose Particles Used as Binders in Making Compressed Starch Pellets—Howard File, to A. E. Staley Mfg. Co., Decatur, Ill. No. 2,129,919. Sept. 13, 1938.

Poultry Electrocuted as Throat is Cut—Otto Elmer Sargent and James Raymond Pichinino, San Francisco, Calif. No. 2,129,968. Sept. 13, 1938.

Batches of Sugar Crystals Covered With Film of Non-Sugar Impurities Washed Consecutively and Progressively with Large Quantities of Saturated Water-Sugar Solution Whose Temperature is Increased For Each Subsequent Batch—Gustave T. Reich, Philadelphia, Pa. No. 2,130,028. Sept. 13, 1938.

Non-Sugar Content of Molasses and Sugar Syrups or Juices Recovered in Solid Form and Free From Sucrose Content—Guastave T. Reich, Philadelphia, Pa. No. 2,130,029. Sept. 13, 1938.

Potato Slices Periodically Immersed in Cooking Bath and Continuously Moved Toward Discharge End of Cooking Vat by Mechanical Means—Joseph D. Ferry, Harrisburg, Pa. No. 2,130,082. Sept. 13, 1938.

DeFatted Soya Grits Made Into Toasted Flake Form—Frank F. Hasbrouck, Peoria, Ill. to Allied Mills, Inc., Chicago, Ill. No. 2,130,087. Sept. 13, 1938.

Bakery-Product Doughs Deposited on Conveyor in Overlapping Layers—Kenneth D. Loose, Bronxville, N. Y. and Charles Wayne Watkins and Joseph W. Green, Dayton, Ohio to Loose-Wiles Biscuit Co., Long Island City, N. Y. No. 2,130,097. Sept. 13, 1938.

Fruits, Nuts and Similar Solids Added to Ice Cream During Freezing Operations by Mechanical Means—Harry B. Adams, to Cherry-Burrell Corp., Chicago, Ill. No. 2,130,113. Sept. 13, 1938.

Papain Product in Dry Form Made to Contain Dry Yeast and Low-Fat Cocoa Powder—Alfred Klotz, Munich, Germany. No. 2,130,137. Sept. 13, 1938.

Meat Defrosted by Contact With Heated Water Flowing Sufficiently Fast Through Vat to Move Meat to Discharge End and to Come in Contact With Meat Several Times During Passage Through the Vat—George A. Hormel, Los Angeles, Calif. to Geo. A. Hormel & Co., Austin, Minn. No. 2,130,237. Sept.13,1938.

Frozen Confections Packaged in Cylindrical Shaped Paper Container Closed at Each End by Flange-Gripping Covers—Frederick T. Krein and Torris H. Alfreds, Park Ridge, Ill. to Dixie-Vortex Co., Chicago, Ill. No. 2, 130, 588. Sept. 20, 1938.

Milk and Cream Heat-Treated by Direct Contact With Steam Under Reduced Pressure—Bernard W. Hammer, Ames, Iowa and Herman C. Horneman and Milton E. Parker, Danville, Ill. to Sealtest System Laboratories Inc., Baltimore, Md. Nos. 2,130,643; 2,130,644; and 2,130,645. Sept. 20, 1938.

Whip-Type Topping Having a Bulk Five Times That of the Original Ingredients Made From Chilled Evaporated Milk, Sugar, Dry Powdered Gelatin—Edward P. Sadler, Louisville, Ky. No. 2,130,654. Sept. 20, 1938.

Food Frozen in Tunnel Type Compartment Into and From Which the Material May be Moved on Shelved Racks—Mikail T. Zarotschenzeff, Rochester, N. Y. to Z Pack Corp., Jersey City, N. J. No. 2,131,131. Sept. 27, 1938.

Organic Products Fumigated by Subjection to ½-in. Column of Mercury Pressure and Injection of Mixture of Fumigated Gases Sufficient to Give Pressure of About 5 lb. Per Sq. In.—John M. Baer, Chicago, Ill. and Earl P. Collins, Little Neck, Long Island, one-half to Guradite Corp. Chicago, Ill.; one-half to Carbide & Carbon Chemicals Corp. No. 2,131,134. Sept. 27, 1938.

Food Package Prepared for Filling and Filled so as to Keep Contents in Contact With Inert Gas—James Kantor, to Liquid Carbonic Corp. Chicago, Ill. No. 2,131,181. Sept. 27, 1938.

Vegetable Pigment Concentrate Made From Vegetable Substances Containing Water and a Vitamin or Pro-Vitamin Vegetable Pigment Substantially Insoluble in Water—William H. Test, Los Angeles, Calif. No. 2,131,394. Sept. 27, 1938.

Baking Powder Made From Acid and Alkaline Constituents Each Carrying an Electrostatic Charge of High Intensity and Like Sign to Keep Them Mutually Repellant—Augustus H. Fiske, Warren, R. I. to Rumford Chemical Works, Rumford, R. I. Nos. 2,131,431; 2,131,432; 2,131,433. Sept. 27, 1938.

Cream Frozen By Passage Between Rotating Surfaces of Chilled Rolls—Alex Johnson to Land O'Lakes Creameries, Inc., Minneapolis, Minn. No. 2,131,439. Sept. 27, 1938.

Cereal Products Made From Steamed Wheat Containing 22 Per Cent Moisture by Flaking, Drying Until Brittle, Breaking Into Small Pieces and Flavoring With Sugar, Puffing to Increased Size by Toasting, and Drying to Remove Water After Spraying With Salt Solution—Eugene H. McKay, to Kellogg Co., Battle Creek, Mich. No. 2,131,450. Sept. 27, 1938.

Tax Savings

(*Continued from page 670*)

to date. The new item is then recorded in the books at a cost of $20,000, all of which is subject to depreciation.

Today, with higher costs in part contributed by heavier taxes, tax savings should be of interest to every taxpayer, and while the above procedures require study, they should certainly be considered if not for every piece of equipment then at least for those items costing, let us say, in excess of $1,000. Such allowances as will probably result from the barter or trade-in and the tax savings which may be effected would more than warrant the accounting work involved.

NOW GMC DIESEL TRUCKS

3-4-6-CYLINDER .. REVOLUTIONARY 2-CYCLE

All-New GMC Trucks with All-New Engines for 1939

GMC alone among trucks offers a *full* line of Diesels—12 new models! The new 2-cycle Diesel principle employed by GMC reduces engine size and weight—giving more power for weight—and makes engine operation extremely flexible and smooth. The GMC Diesel fuel injection system meters the fuel, injects and atomizes it perfectly, a separate unit injector feeding directly at each cylinder. Easy to understand, easy to service, the new GMC Diesels are also extremely economical.

All-new GMC valve-in-head gasoline engines in all-new GMC chassis—including every needed size for practical purposes—the most extensive line of high-powered trucks in 40 years' commercial vehicle history!

Our own YMAC Time Payment Plan assures you of lowest available rates

EXCLUSIVE GMC DIESEL

FEATURES

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- ★ **Independent fuel injector located at each cylinder!**
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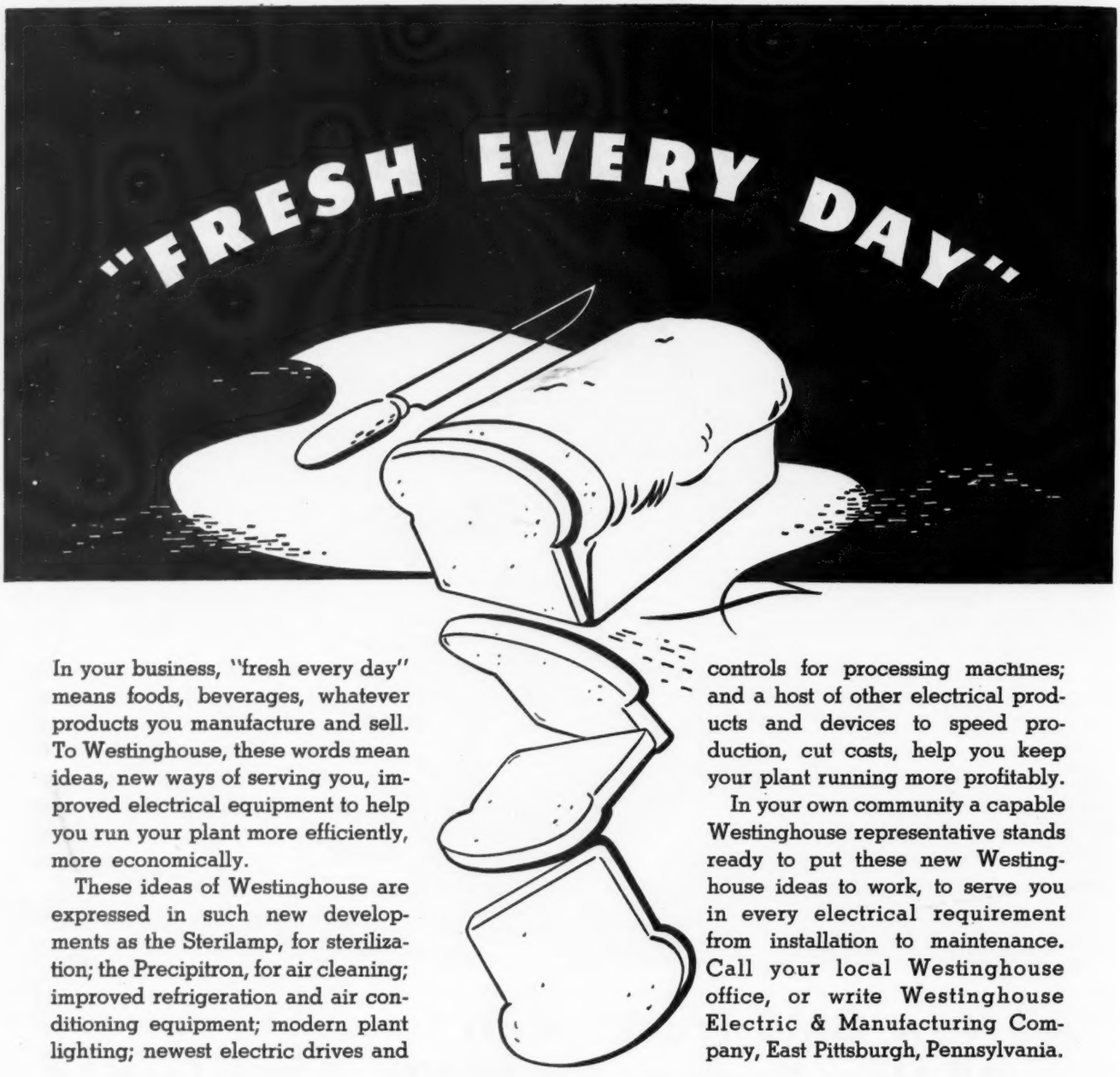
THE TRUCK OF VALUE GMC

TRUCKS ★ TRAILERS ★ DIESELS



In your business, "fresh every day" means foods, beverages, whatever products you manufacture and sell. To Westinghouse, these words mean ideas, new ways of serving you, improved electrical equipment to help you run your plant more efficiently, more economically.

These ideas of Westinghouse are expressed in such new developments as the Sterilamp, for sterilization; the Precipitron, for air cleaning; improved refrigeration and air conditioning equipment; modern plant lighting; newest electric drives and controls for processing machines; and a host of other electrical products and devices to speed production, cut costs, help you keep your plant running more profitably.

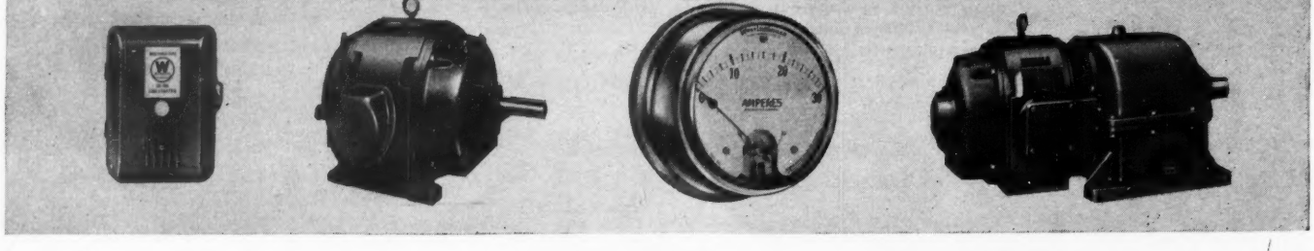
In your own community a capable Westinghouse representative stands ready to put these new Westinghouse ideas to work, to serve you in every electrical requirement from installation to maintenance. Call your local Westinghouse office, or write Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania.

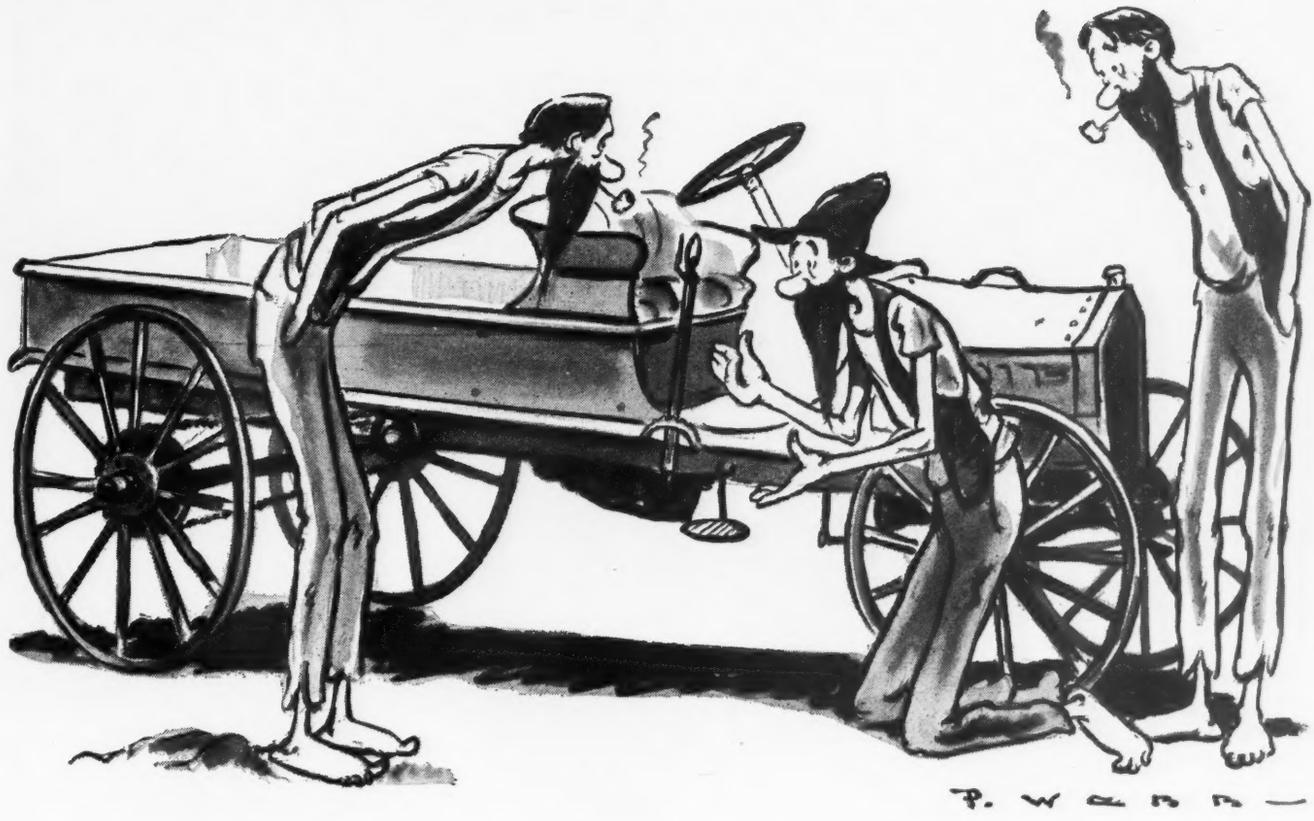
Westinghouse

ELECTRICAL PARTNER OF THE FOOD INDUSTRY

J-93769

A FEW TYPICAL PRODUCTS FROM THE COMPLETE LINE OF WESTINGHOUSE ELECTRICAL EQUIPMENT FOR THE FOOD INDUSTRY





"S'pose she'd run on coal oil, Luke?"

SURE SHE WILL, Luke, if she can run at all. Fact is, most any automotive vehicle will run on most any petroleum fuel, if she'll start and if you don't care *how* she runs.

What's that? *You* want performance, economy, fast schedules from a modern high compression engine? That's different. Then *good gasoline* is the answer.

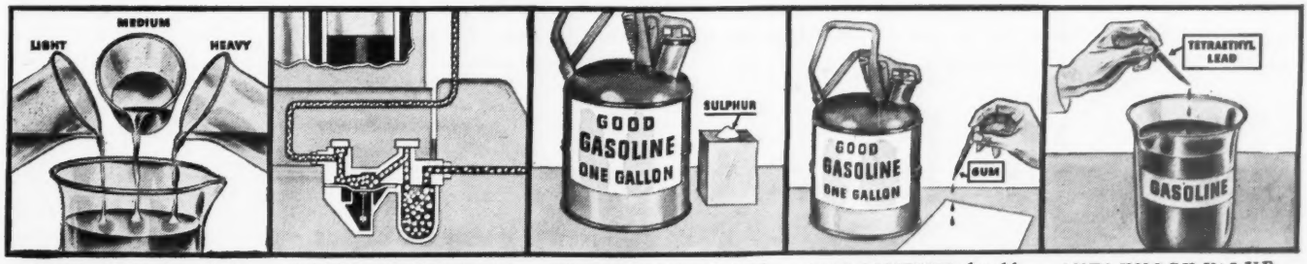
How do you know good gasoline? Ask about volatility—at what temperature vaporization begins, at what temperature the gasoline is completely vaporized. Ask about vapor pressure—how many pounds per square inch. Unless the vapor pressure fits your operating conditions, you may get vapor lock and a stalled motor.

Ask about gum content and harmful sulphur content and make sure they're low. Ask about anti-knock value, and be sure that's high.

When you buy gasoline with "Ethyl" or regular gasoline containing tetraethyl lead, you're sure you are getting high anti-knock value. These fuels measure up on the other points and give you the power and economy the manufacturer of your vehicle intended you to receive.

If you have further questions, write or get in touch with the Ethyl Gasoline Corporation, Chrysler Building, New York, N. Y., manufacturers of anti-knock fluids used by oil companies to improve gasolines.

5 RULES FOR GOOD GASOLINE



VOLATILITY should be balanced, for full power and best economy.

VAPOR PRESSURE should be adjusted to meet operating conditions.

EXCESSIVE AMOUNTS of sulphur may be harmful in cold climates.

GUM CONTENT should not exceed ¼ of a gram (4 small drops) per gallon.

ANTI-KNOCK VALUE should be high, of at least 68 octane number.

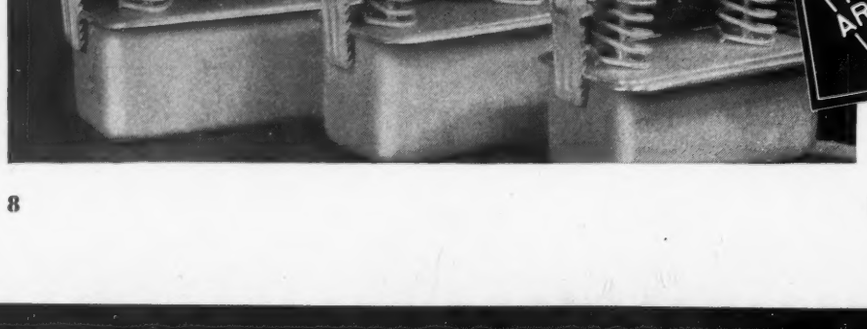
THE BETTER THE GASOLINE THE BETTER THE PERFORMANCE

"Pigs is Pigs -but Ham am what you make it!"

Sam is right! That precious flavor is the result of skilful care. And Sam's artistry is at its delicious best because it's cooked in Armco Stainless Steel boilers to protect its goodness.

This useful metal is tops wherever food is handled. It helps preserve flavor and keeps down spoilage. Micro-organisms have a tough time of it. The smooth, hard surface of Armco Stainless provides no hiding place for bacteria, making equipment easy to keep clean and sanitary. Food contamination, off-taste or poor color are no longer cause for worry. Maintenance costs are also greatly lessened. Armco Stainless Steel is highly resistant to corrosion, and it is a well known fact that ordinary food acids cannot attack or stain it.

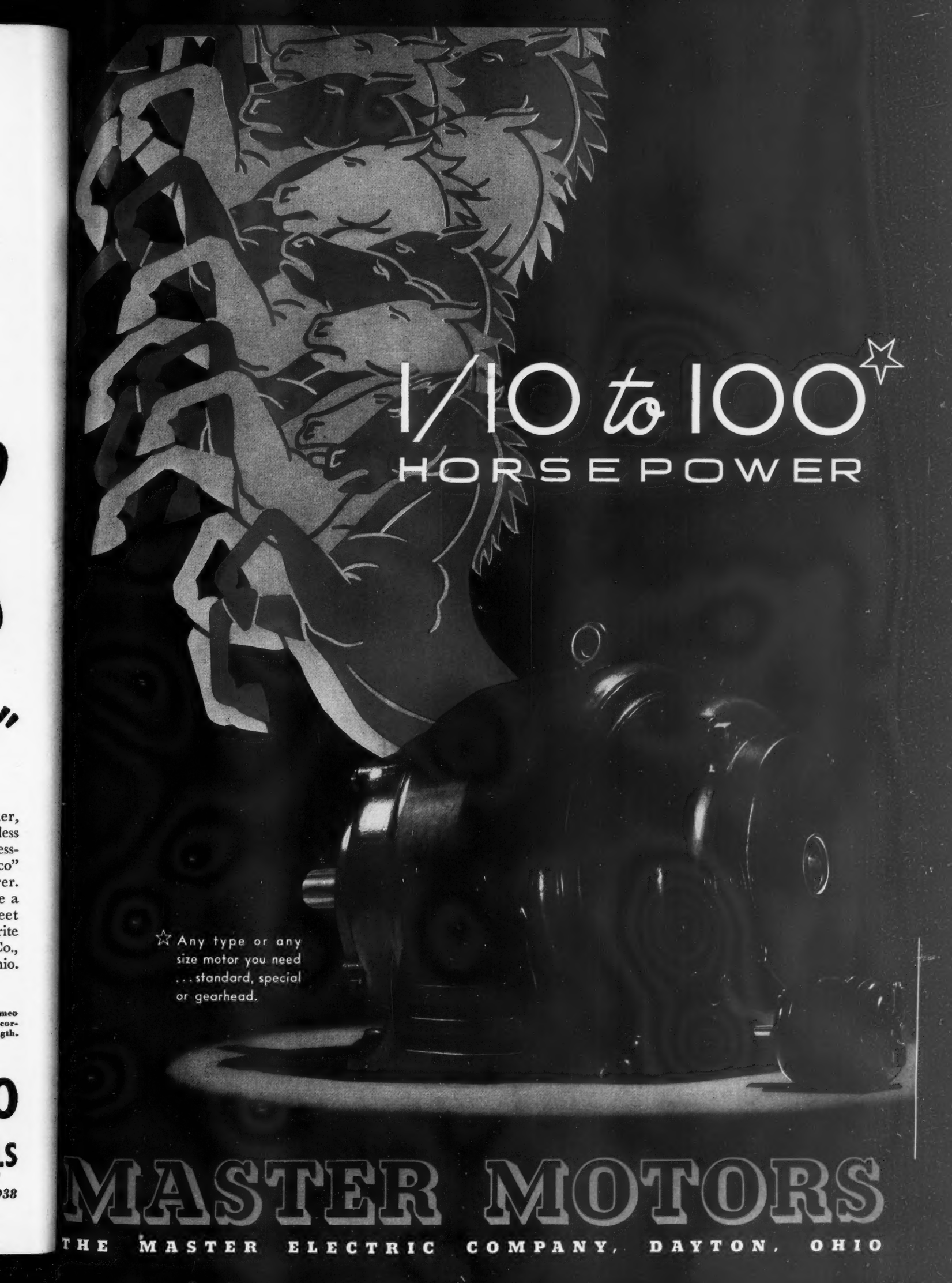
Whether you are a meat packer, canner, baker or dairyman, stainless steel is a wise choice for food processing equipment. Just specify "Armco" to your equipment manufacturer. For maintenance requirements see a nearby Armco distributor or sheet metal shop. On special problems write to us. The American Rolling Mill Co., 2171 Curtis St., Middletown, Ohio.



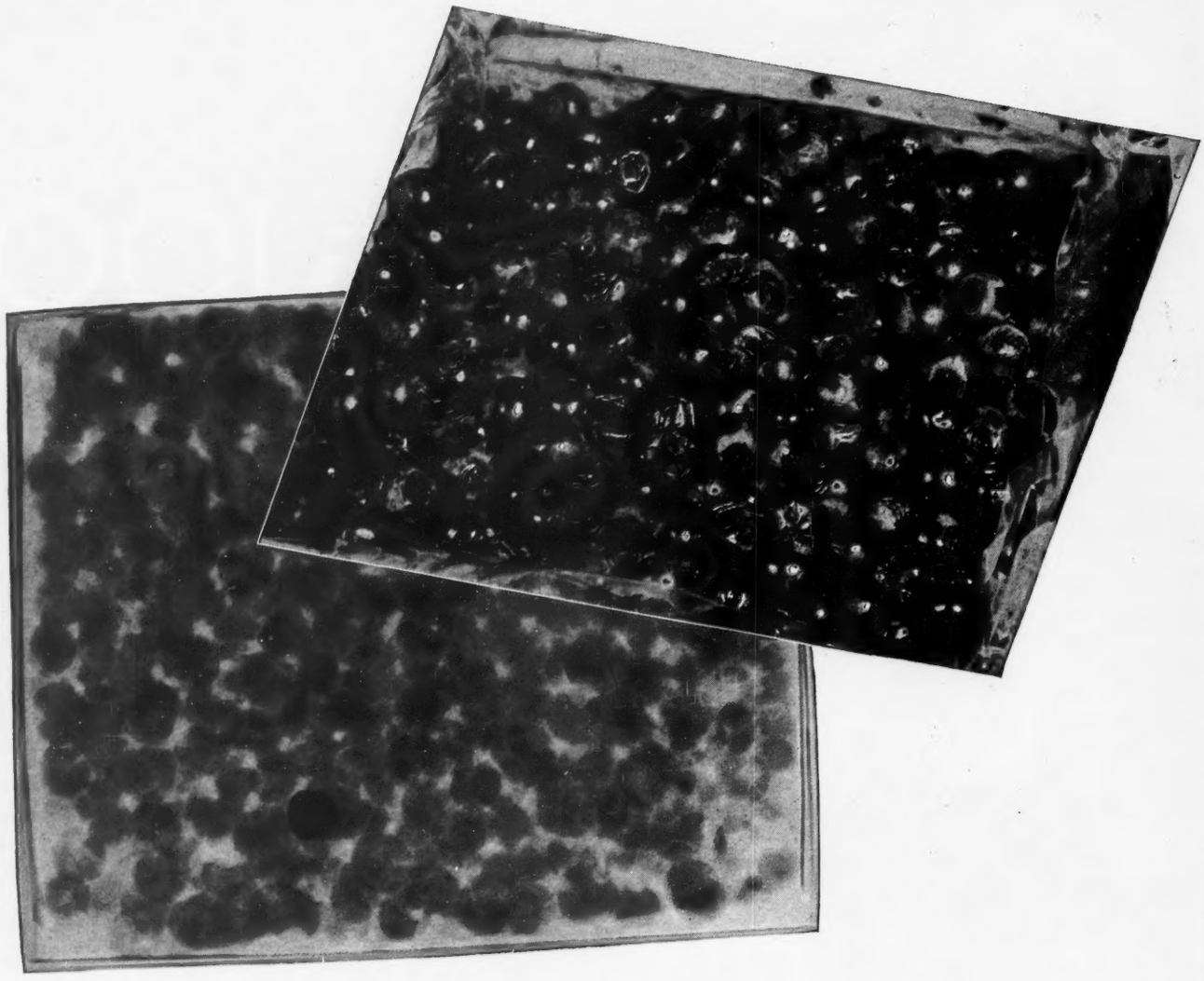
Ham boilers drawn from single sheets of Armco Stainless. Features include easy cleaning, corrosion resistance and great strength.

ARMCO

STAINLESS STEELS


1/10 to 100☆
HORSEPOWER
☆ Any type or any size motor you need ... standard, special or gearhead.
MASTER MOTORS
THE MASTER ELECTRIC COMPANY, DAYTON, OHIO

Before or After Freezing You Can Check by X-Ray



A SMALL dark shiny stone in a package of quick-frozen blueberries would be easy to find by x-ray. On the x-ray viewing screen it shows up as a dark spot, contrasting with images of the berries, as illustrated in the lower picture. Yet, to the naked eye, the same package would look just as harmless as in the upper photograph. Or, if it fits your method of processing better, you can follow the method used by several progressive canners: examine the material *before* it is packed.

A final check, after processing is completed and the food in its container, would have its advantages. An early inspection of raw materials would help to prevent foreign bodies and many kinds of imperfections from even starting toward the finished product. At one end of the production line or the other—or both, if need be—G-E Visual Inspection X-Ray Units guard quality—and do it with the speed and accuracy demanded in the food industries. These units are built specifically for food inspection—to help maintain the rigid standards of perfection you have set.

There are four basic types of G-E food inspection units, designed to handle foods in various stages from raw materials to packaged product, and engineered to fit in production systems at the most strategic points. Why not ask, now, for the services of an experienced x-ray engineer to help you decide which one is best suited to your needs—to enable your inspectors to look right *through,* not just at, the food you sell. Address Dept. I 512.

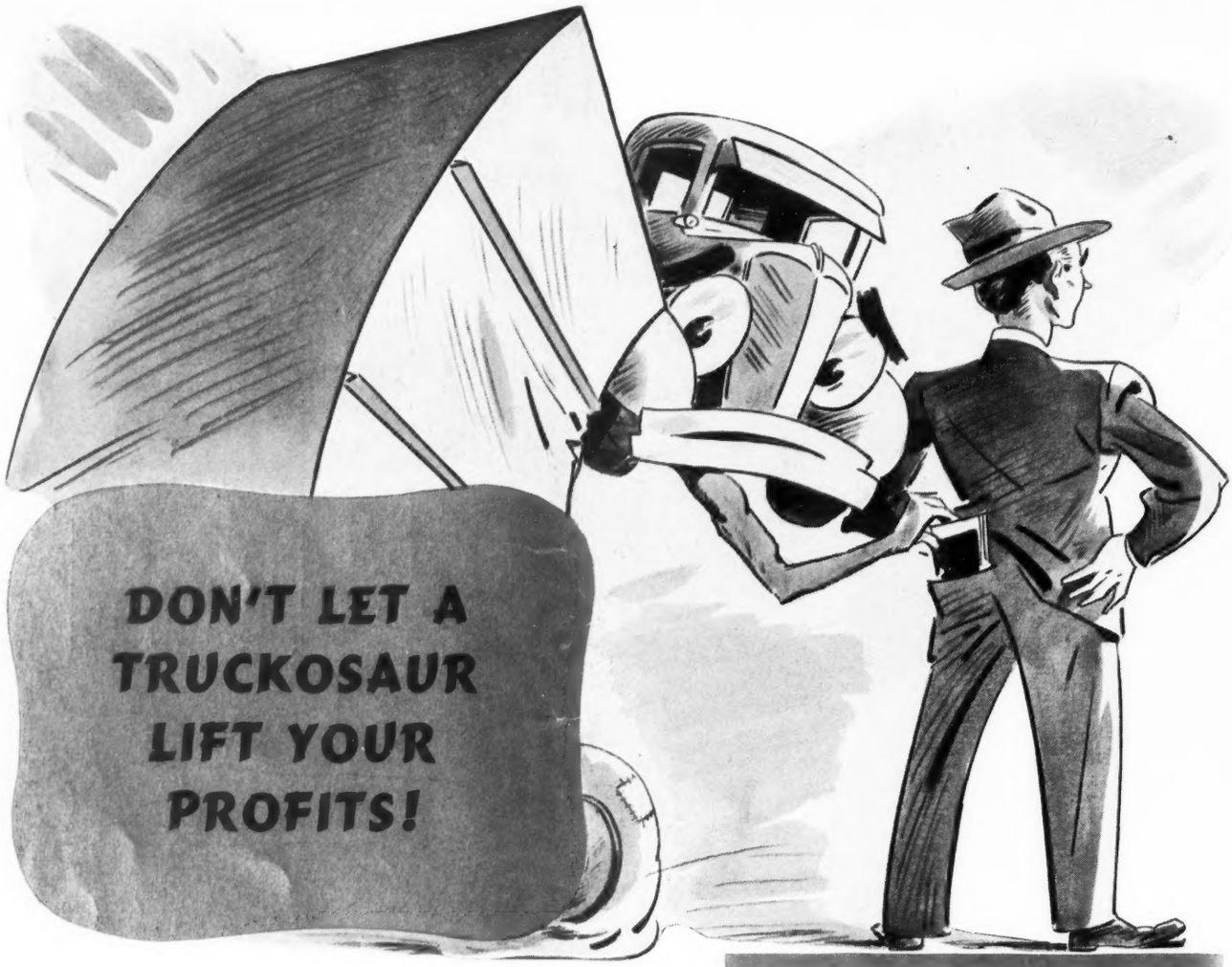
GENERAL ELECTRIC X-RAY CORPORATION

2012 JACKSON BOULEVARD CHICAGO, ILLINOIS

Color—and design in modern packaging is the new selling force of today. And rightly so, for the skillful use of color is a major factor in eye-appeal—the element which stimulates the consumer to reach out his hand toward the product...Of course, there are other important and practical factors, too, which have to do with the size, shape, construction of the package for automatic filling, safe shipping, convenient usage...These are but a few of the many points Continental's packaging experts check when they study your problem. Why not let them give your package a thorough "going over"? It costs nothing for our suggestions and they may mean much to you—in increased sales!

ONE OF A SERIES DEVOTED TO THE USE OF COLOR IN PACKAGING DESIGN. COPYRIGHTED, 1938.

Continental Can Company



CURSED by heavy bodies which made them inefficient, Dinosaurs became extinct long ago. But Truckosaurs, trucks with heavy bodies built of heavy materials, are more stubborn. Many are still stealing profits from neglectful operators. Truckosaurs, however, are doomed, because light bodies constructed of light, strong alloys of Alcoa Aluminum, carry more payload, earn more on invested capital. Have you got rid of your Truckosaurs?

Would you like to cut your hauling costs? Check your garages, see how many "Truckosaurs" are there. When you weed them out, remember the advantages of new bodies constructed of Aluminum. The most important benefit, besides lightness, is structural strength which is obtained because light alloys of Aluminum can be used in sections which are thick, hence stiff, hence structurally sturdy. Note other points listed at right.

ALCOA ALUMINUM

MAKES TRUCK BODIES LIGHTER
TO HAUL MORE PAYLOAD CHEAPER

ONLY ALUMINUM CAN GIVE ALL THESE BONUS LOAD BENEFITS!

STRENGTH AND LIGHTNESS *with* SAFETY results when you build with light, strong alloys of Alcoa Aluminum. The material itself is light, so sections can be made thick, stiff, and strong. We cooperate with body builders to help you get the best results.

LONG LIFE — Often Aluminum bodies outlast several chassis. Finally, as salvage, they return far more. Reason: higher scrap value.

MAINTENANCE ON THE OUTSIDE — Paint holds to Aluminum better, lasts longer, giving more attractive units.

COST — A per-pound breakdown of hauling cost reveals the reason for using Aluminum. Usually figures show that extra capacity cuts costs, so the savings pay the extra first cost in less than one year.

FRIENDLY TO FOOD — The metal is non-toxic, non-contaminating, and does not harbor odor. Count in improved appearance, too, another important advantage in trucking food products.

PRECISE INFORMATION on saving from use of light bodies built of Alcoa Aluminum is available, from case studies of the experience of many typical users. The data may be obtained in the free handbook, "*Alcoa Aluminum for Truck Bodies*," Ask us to send it. ALUMINUM COMPANY OF AMERICA, 2152 Gulf Building, Pittsburgh, Pennsylvania.

30 Years Veteran Packer

LIKES "Wear-Ever" BEST

W. J. FOELL SAYS:

Battery of "Wear-Ever" Steam Jacketed Kettles in operation at The Foell Packing Co.

FOELL PACKING COMPANY

ROSE BRAND — EAGLE

3117-23 WEST 47TH STREET
CHICAGO

July 6, 1938

The Aluminum Cooking Utensil Co.
111 West Washington Street
Chicago, Illinois

Attention Mr. B. E. Hiles

Gentlemen:

During our thirty years experience in the Canned Meat Industry we have used many styles and kinds of equipment in the preparation of our products.

Among the items used, none have given us more genuine satisfaction and dependable service than the "Wear-Ever" aluminum kettles we purchased from you.

We have found them to be so practical, dependable, and easy to keep clean. They seem to render most every service under constant operation.

To be able to tell you how satisfied with these kettles we are affords us considerable pleasure. We do not hesitate to recommend them to all users of equipment of this kind.

Respectfully yours,
FOELL PACKING COMPANY
By W. J. Foell
President

WJF:JS

—PACKERS OF QUALITY MEAT FOOD PRODUCTS—

Characteristic of endorsements from all over the country, is Mr. Foell's statement, "*None have given us more genuine satisfaction and dependable service than the 'Wear-Ever' Aluminum Kettles we purchased from you.*"

For equal satisfaction and economy, you too will want "Wear-Ever" Steam Jacketed Kettles. Our new catalog lists complete specifications. Write to THE ALUMINUM COOKING UTENSIL CO. Desk 912, 11th Street, New Kensington, Pa. (*Offices In All Principal Cities*)

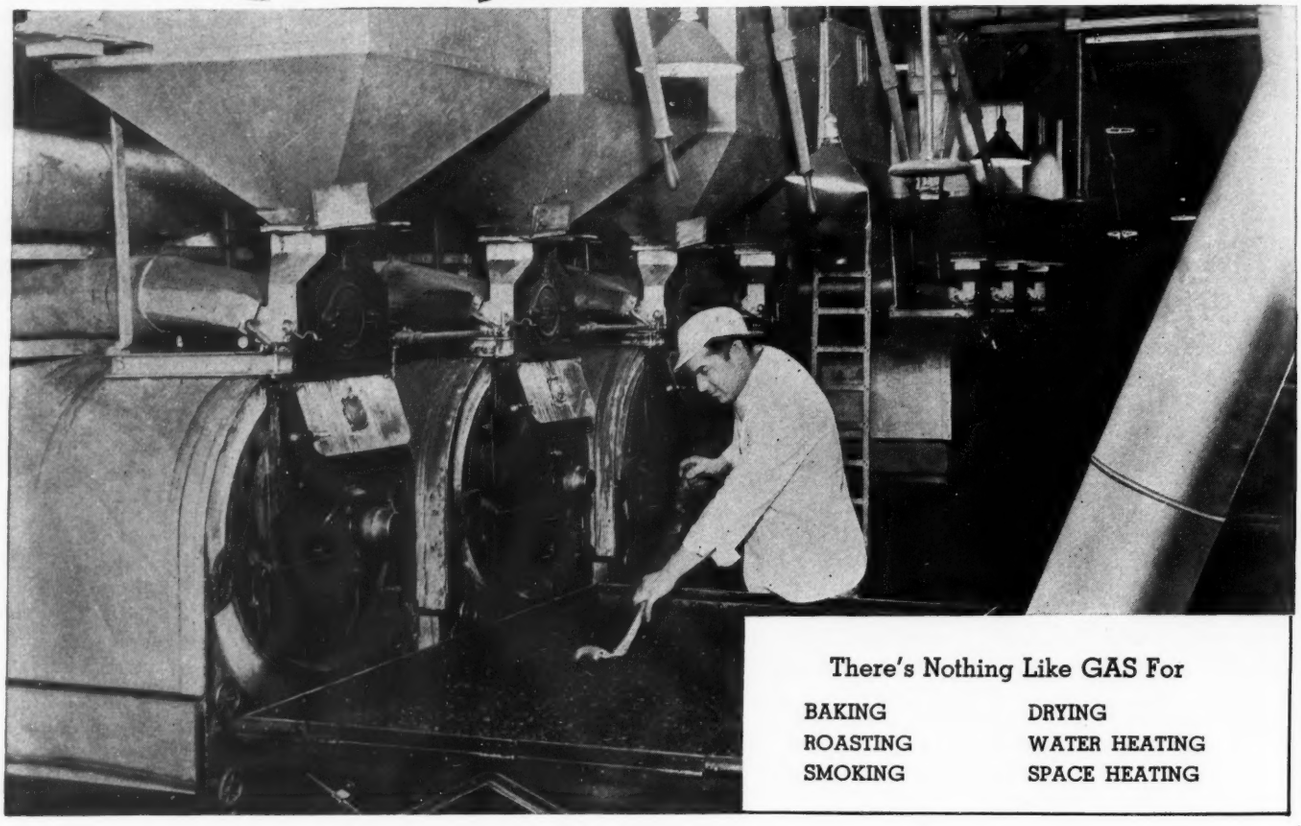
WEAR-EVER TACO ALUMINUM TRADE MARK REG. U.S. PAT OFF.

"Wear-Ever" ALUMINUM

THE STANDARD: WROUGHT OF EXTRA HARD, THICK ALUMINUM

Gas GIVES THAT VITAL PERFECT BAKE IN PREPARING COCOA FOR FINE CANDY

GAS-heated cocoa bean roasters at Long Island City plant of Loft, Inc.



There's Nothing Like GAS For

BAKING	DRYING
ROASTING	WATER HEATING
SMOKING	SPACE HEATING

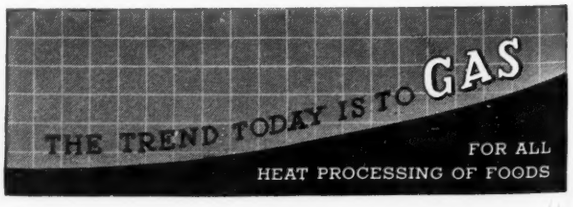
Given a perfect bake of selected cocoa beans—with the correct flavor, moisture content and physical properties developed in the roaster—the subsequent processing of fine chocolate is greatly simplified.

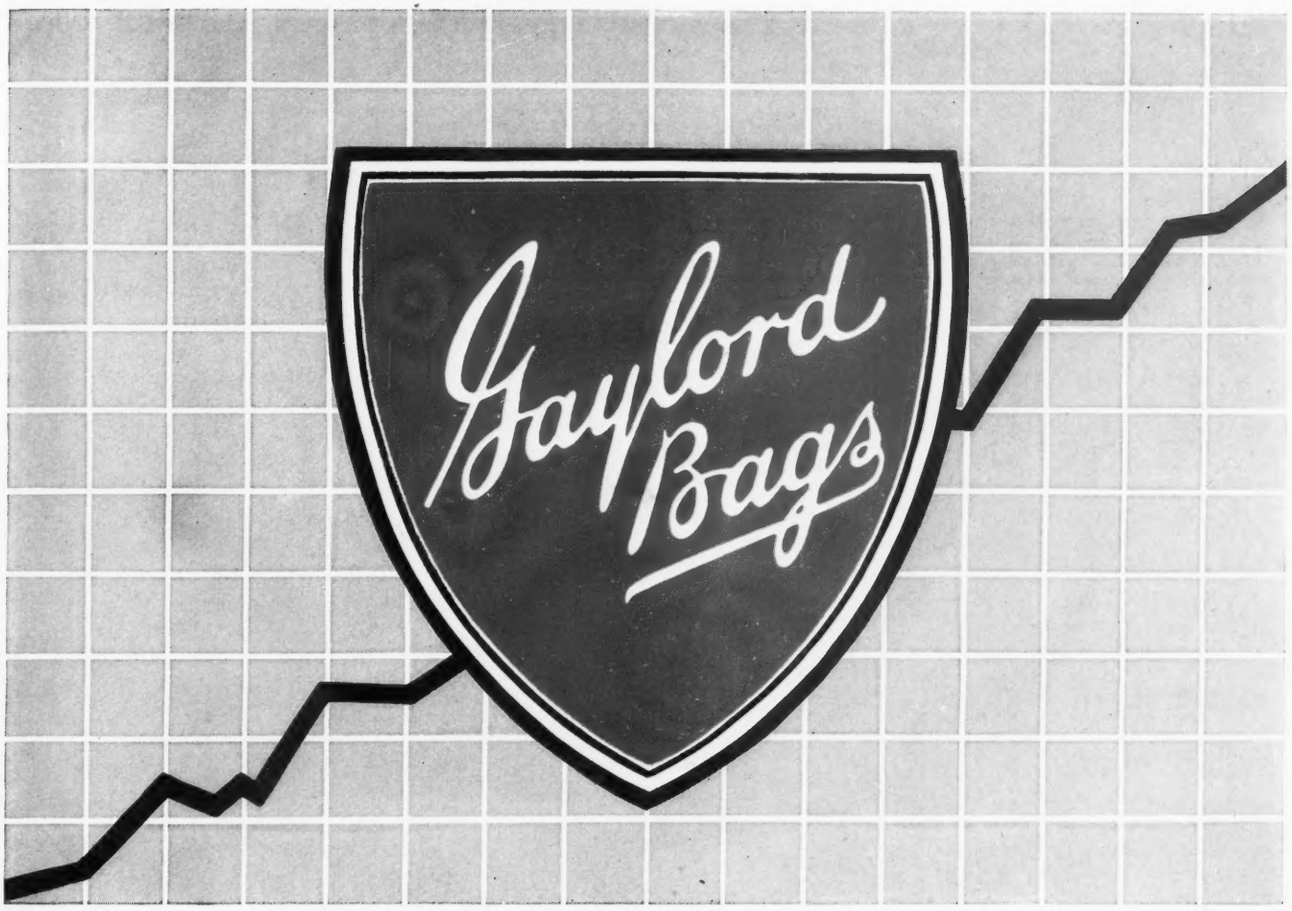
That is why the famous Loft Studios, makers of fine candies for discriminating New Yorkers, employ GAS-fired equipment in their modern plant.

The combination of dependable GAS fuel and up-to-date GAS equipment for heat processing foods insures a finished product of improved quality, a reduction in loss from spoilage, more economical operation and lower costs all along the line.

Investigate the money-saving and profit-making possibilities in the application of GAS to <u>your</u> plant!

AMERICAN GAS ASSOCIATION
INDUSTRIAL GAS SECTION
420 LEXINGTON AVENUE, NEW YORK





SETTING A NEW HIGH IN KRAFT BAG VALUE

Specify Gaylord Kraft Grocery Bags and Sacks when you order from your jobber—they are always full-weight and uniform in size—look good, too. ''' Grocers have found they have fewer "spills" with Gaylord Bags. ''' There is a reliable Gaylord jobber near you.

GAYLORD CONTAINER CORPORATION

General Offices: SAINT LOUIS

Gaylord Kraft

Makers of Gaylord Corrugated and Solid Fibre Shipping Containers ... Gaylord Folding Cartons ... Gaylord Kraft and Specialties.

Gaylord Boxes

WHEN YOU FIGURE YOUR LUBRICATION COSTS...

bring COMPARATIVE MAINTENANCE COSTS *into the picture*

then learn the real value of

GULF'S *higher quality* LUBRICANTS!

TRY this measuring stick on your lubrication costs: compare your maintenance costs from month to month and determine whether they are going up or down. If maintenance is high, ineffective lubrication may be the reason . . . and no matter how little you're paying for lubricants, your *real* lubrication costs may be too high!

After making a careful study of comparative maintenance costs, an official of a large operating company recently said: "Of course we are paying a few dollars more each month for Gulf's higher quality lubricants, but look at this reduction in maintenance costs! Our actual dollar savings amount to nearly ten times the total cost of the lubricants. At that rate we're getting our oils and greases for less than nothing . . . *and that's the lowest lubrication cost I ever heard of!*"

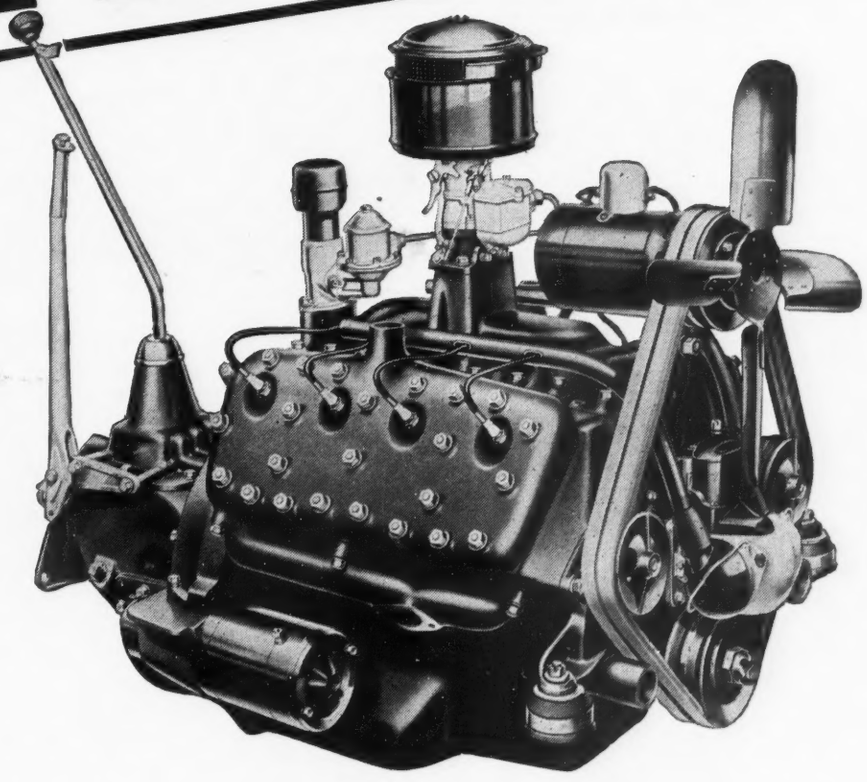
You may find it difficult to evaluate all the intangible factors that make up your final lubrication costs. But of this you may be sure: when you put Gulf's higher quality lubricants to work you have taken a forward step toward improving production, reducing waste, cutting maintenance expense and making over-all savings which will give you the lowest possible "lubrication costs."

Ask the Gulf representative who calls at your plant to discuss this matter in detail. He can help you get a true picture of your actual lubrication costs. Gulf Oil Corporation—Gulf Refining Company, Gulf Building, Pittsburgh, Pa.

GULF INDUSTRIAL LUBRICATION

Also MAKERS OF A COMPLETE LINE OF FUEL AND FURNACE OILS

LIFE BEGINS AGAIN



This Ford V-8 engine holds an impressive record for service. Behind it are thousands of miles of payload performance . . . countless tough jobs, done with the V-8 dependability and economy for which Ford engines are distinguished.

Now its second life begins. Factory reconditioned, it is ready to give new engine performance with new engine economy. That's the way the Ford Engine and Parts Exchange Plan works. And for you, this unique plan does two things:

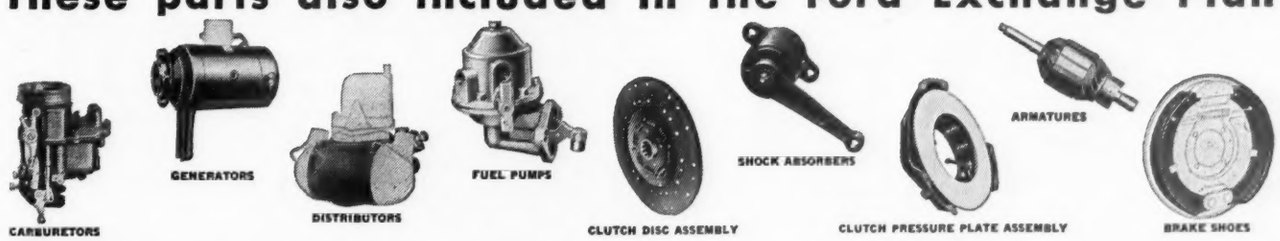
IT SAVES YOU TIME

It's much quicker to get an exchange engine or other assembly through a Ford dealer than it is to tie up the truck and wait for the original unit to be repaired or overhauled. In the case of the engine, the Exchange Plan often cuts this time from days to hours.

IT SAVES YOU MONEY

It's a Ford idea that the factory which builds the engine is best equipped to recondition it. Ford uses the same efficient methods, and the same types of precision machines in reconditioning that are used in making the original units. This cuts costs, and you get the savings.

These parts also included in the Ford Exchange Plan



FORD V·8 TRUCKS AND COMMERCIAL CARS

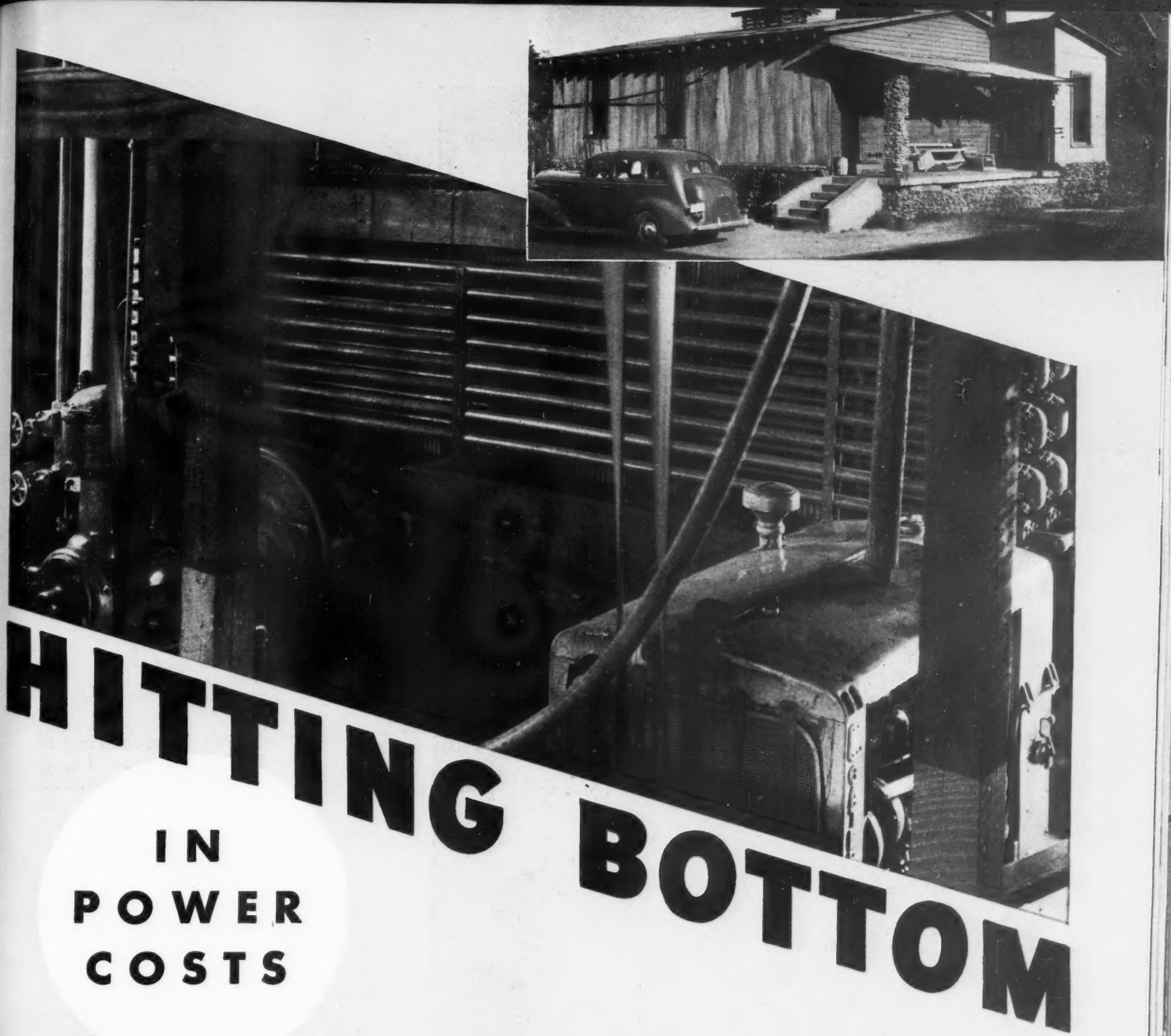
POWELL BRONZE VALVES GIVE MANY YEARS OF *Longer Service*

A TYPE AND SIZE FOR EVERY INDUSTRIAL REQUIREMENT.

Powell Bronze Valves are backed by nearly a century of experience in meeting ever-increasing plant conditions. No matter how small or how large your valve requirements are, the Powell Engineering Staff extends its fullest cooperation to help solve your problems. . . . . .

POWELL VALVES

THE WM. POWELL CO. CINCINNATI, OHIO



HITTING BOTTOM IN POWER COSTS

IF YOU think your present power costs are low, just compare them with those of this (or any other) "Caterpillar" Diesel Engine. Check its advantages against those of other types of power. Your findings will give you the reasons why so many ice and food industries are turning to "Caterpillar" Diesels for refrigeration power. The above installation, in the plant of the Columbiana (Alabama) Ice Company, offers a case example:

When these pictures were taken the 47-horsepower "Caterpillar" Diesel Engine had already registered 4500 operating hours. Running on a 24-hour daily schedule five months of the year, and 120 hours monthly during the remainder, its fuel, lubrication and maintenance cost averaged *only 22c an hour*. The engine drives a 6x6 ammonia compressor, well pump, agitator, core sucker and blower. Capacity, 5 tons per day.

With normal care and maintenance, "Caterpillar" Diesels will show similar low power costs in *any* locality—mainly varying only according to the local price of Diesel fuel (which is comparatively inexpensive everywhere).

"Caterpillar" Diesels have additional advantages: Simplicity makes them easy to look after. . . . No delicate adjustment or specially trained attendant is necessary. Precision manufacture, quality materials and sound construction give them long serviceable life that makes the yearly depreciation write-off small indeed. At present reduced prices, and with their dependability thoroughly established by thousands of actual-service records, these sturdy, compact, truly modern power-plants invite your inspection NOW. There's a "Caterpillar" dealer near you.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

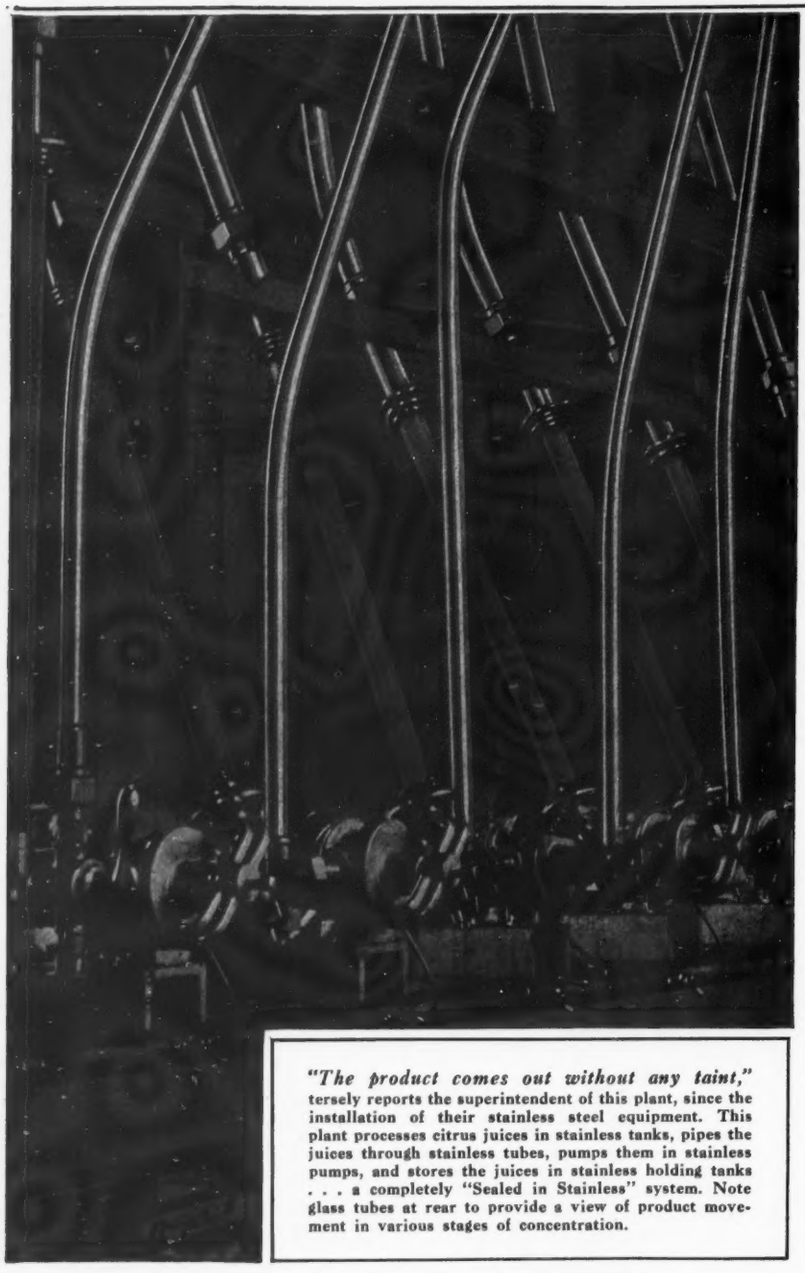
CATERPILLAR DIESEL POWER

REG. U.S. PAT. OFF.

DIESEL ENGINES—9 sizes, 32 to 160 hp. (max. rating) • DIESEL-ELECTRIC GENERATOR SETS—9 sizes, 15 to 80 kw. (cont. rating)

NATURAL FLAVOR STAYS *In*

. . . METALLIC FLAVOR STAYS *Out*



"The product comes out without any taint," tersely reports the superintendent of this plant, since the installation of their stainless steel equipment. This plant processes citrus juices in stainless tanks, pipes the juices through stainless tubes, pumps them in stainless pumps, and stores the juices in stainless holding tanks . . . a completely "Sealed in Stainless" system. Note glass tubes at rear to provide a view of product movement in various stages of concentration.

when you seal your process in

U·S·S STAINLESS STEEL

WHETHER it's milk or soup or fruit juice or beer that you produce, the flavor's the thing that sells your product. One mistake, one batch of doubtful quality, can quickly turn a rising sales curve down.

So if you want to insure your success, insure your product's taste . . . protect it from every possible type of contamination.

Here's an effective way to do this: Seal your process in U·S·S Stainless Steel. If your product touches nothing but this shining metal, from the time the raw materials enter your plant until you place it in bottles or cans for delivery, you can forget all about contamination.

Stainless keeps natural flavors in . . . and metallic flavors out. Lactic, citric, tartaric, acetic, and other food acids never attack its brilliant surface, are never changed by contact, regardless of the processing temperature.

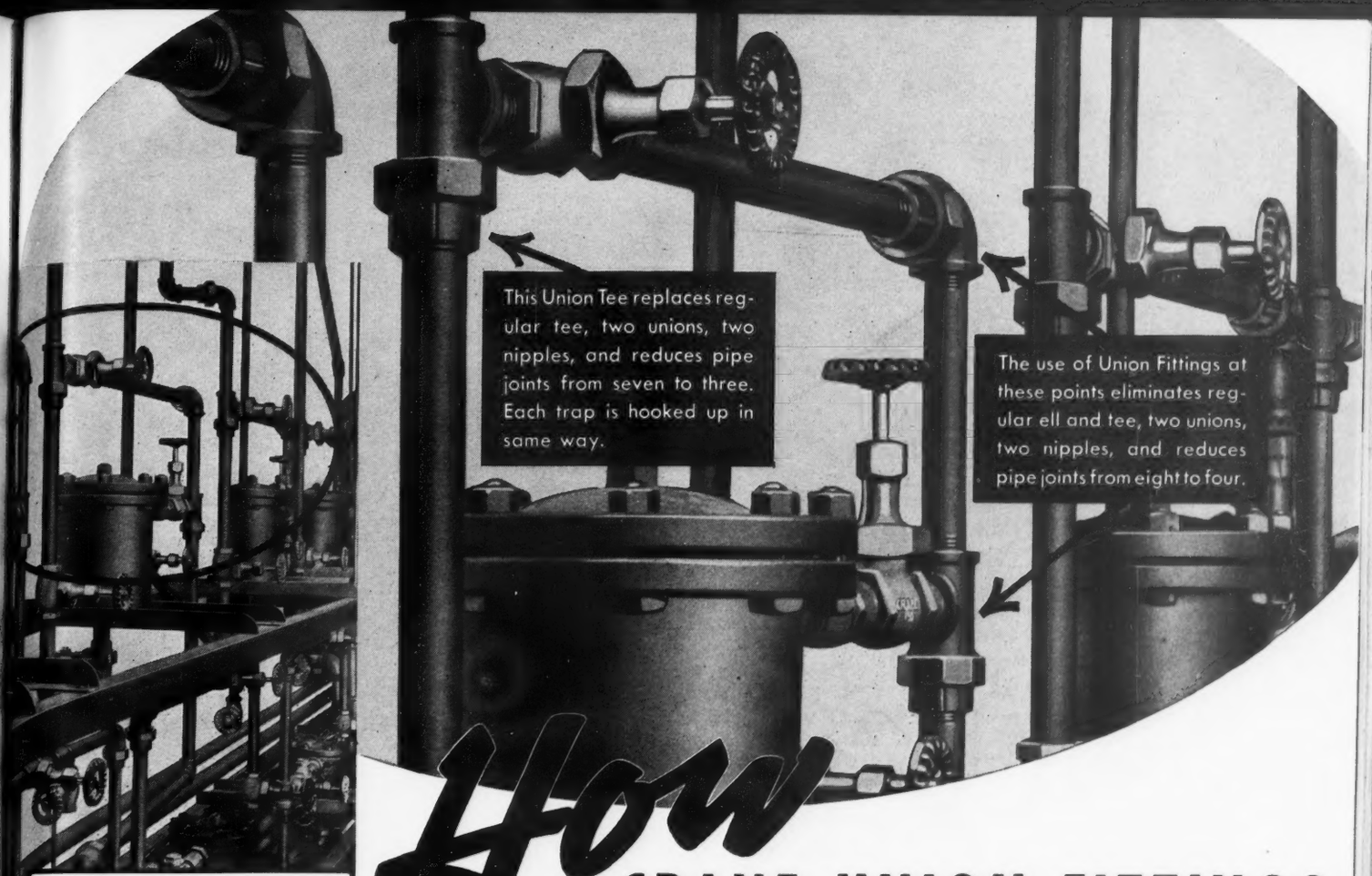
Stainless equipment is easy to clean, too. Never corrodes or pits. Provides no convenient hiding places for particles to lodge in. You merely flush out stainless equipment with steam or hot water, and in a few minutes all surfaces are clean and sterile.

To insure your product's good taste, "Put your plant on the stainless standard."

AMERICAN STEEL & WIRE COMPANY, *Cleveland, Chicago and New York*
CARNEGIE-ILLINOIS STEEL CORPORATION, *Pittsburgh and Chicago*
NATIONAL TUBE COMPANY, *Pittsburgh*

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Products Company, New York, *Export Distributors*
Scully Steel Products Company, *Warehouse Distributors*

UNITED STATES STEEL


This Union Tee replaces regular tee, two unions, two nipples, and reduces pipe joints from seven to three. Each trap is hooked up in same way.
The use of Union Fittings at these points eliminates regular ell and tee, two unions, two nipples, and reduces pipe joints from eight to four.

How CRANE UNION FITTINGS SAVE MATERIAL, TIME AND LABOR

A comparison of piping materials and pipe joints required to hook up this bank of steam traps—

	—with Union Fittings		—with Regular Fittings	
	Quan.	Pipe Jts.	Quan.	Pipe Jts.
Ells	1	2	13	26
Union Ells	12	24		
Tees			11	33
Union Tees	10	30		
Unions			26	52
Nipples	16	32	43	86
TOTALS	39	88	93	197

99 9,996,551/10,000,000 %

of Crane fittings are found fit. Details in folder sent upon request.

The use of union fittings in piping systems is often overlooked. They are valuable even in simple hookups, but in more elaborate layouts, their advantages are emphasized. Because a single union fitting ordinarily serves the same purpose as a tee or elbow, union and nipple, installation costs are minimized—in material, time and labor. Union fittings reduce the number of threaded joints—giving greater safety. Pipe lines gain a workmanlike makeup that adds to plant appearance.

Depend on Crane-Quality union fittings to help keep your liquid, air, and vapor lines at peak efficiency always. The amazing standard of perfection that Crane has attained in the manufacture of millions upon millions of fittings of every type yearly, is strong assurance of their unfailing, trustworthy performance. You'll find that Crane-Equipment throughout your plant brings greatest piping satisfaction, because—in fittings as in valves—

IT'S WHAT'S INSIDE THAT COUNTS!

CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

CRANE CO., GENERAL OFFICES: 836 SOUTH MICHIGAN AVENUE, CHICAGO, ILLINOIS

NATION-WIDE SERVICE THROUGH BRANCHES AND WHOLESALERS IN ALL MARKETS

CRANE SCREWED FITTINGS FOR FOOD PRODUCTS PLANTS

Crane's line of fittings includes not merely the few hundred types and sizes in most common use, but a total of more than 10,000 separate and distinct items in cast and malleable iron.

ELBOWS—90°, 67½°, 60°, 45°, 30°, 22½°, 11¼°, and 5⅝°, Street, Long Sweep, Side Outlet, Drop, Hub Vent

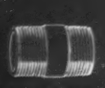
TEES—Service, Four-Way, Drop Tees, Long Sweep, Double Sweep, Wash Tray

COUPLINGS—Right Hand, Right and Left, Half (Also Wrought Iron), Reducers, Increasers

UNION FITTINGS—Male and Female, 90° and 45° Elbows, Tees with Union on Run or Outlet

BUSHINGS—Outside and Inside Hexagon, Face, Eccentric, Double Tapped

PLUGS—Square Head, Solid, Countersunk, Bar, Barrel



NIPPLES—Close, Short, Long, Tank

UNIONS—Ground Joint, Gasket Type, Female, Male and Female, Air-Pump

A CRANE FITTING FOR EVERY PURPOSE—The screwed fittings shown above are only a few of the scores of different types and modifications. The complete Crane line includes banded and plain patterns, black or galvanized, in a wide range of straight and reducing sizes, in four pressure classes in malleable iron and five in cast iron.

"American Can helps us to grow . . .

● I like the way they put their whole effort into helping their *customer's* business to grow. They keep studying the product, plant processes, packing improvements, design, lithography, *everything.* And you can take for granted getting good cans; and when you need them, too."

AMERICAN CAN COMPANY, 230 PARK AVENUE, NEW YORK, N. Y. CANCO

LOWER COST PER CONTAINER

NAME YOUR CONTAINER... *Pneumatic can handle it!

RIGID containers like these indicate Pneumatic's scope. Applying covers, hair-line filling and weighing, neat, secure application of 100% glued, all-around labels.

FOODS in glass. Here, too, Pneumatic renders "lower cost per container" service with a complete range of cleaning, filling, capping and labeling machinery.

FROM individual tea balls to 50 lb. flour sacks; nearly any bag type container can be handled on one or another Pneumatic unit.

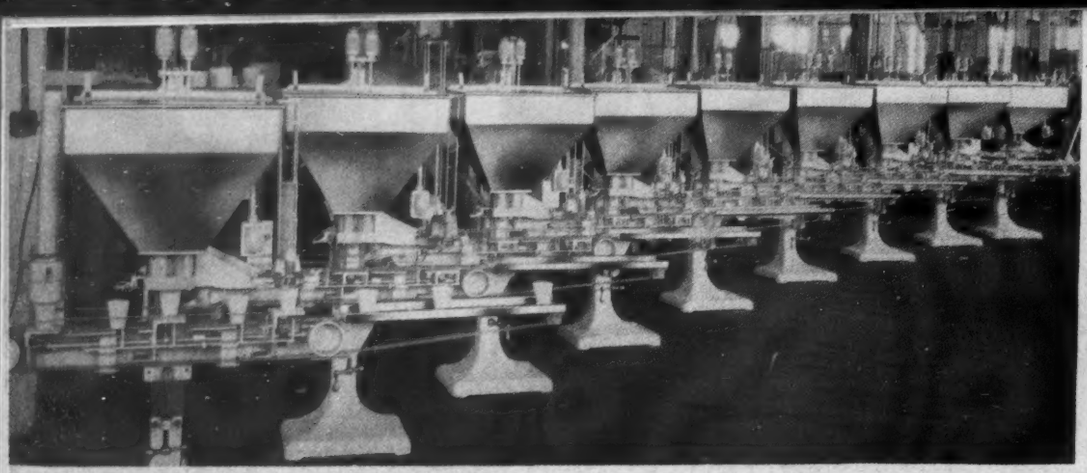
MILLIONS HOURLY. Yes, it is actually true that millions of packages of food products are produced on Pneumatic carton feeding, forming, lining, weighing, closing and wrapping machines every working hour. The packaging leaders are Pneumatic users.

*CHANCES are that your package can be handled at a lower cost on a modern Pneumatic unit. The sixteen types pictured here are just a few of the hundreds being filled or weighed, formed or closed, lined or wrapped, sealed or labeled on Pneumatic machines.

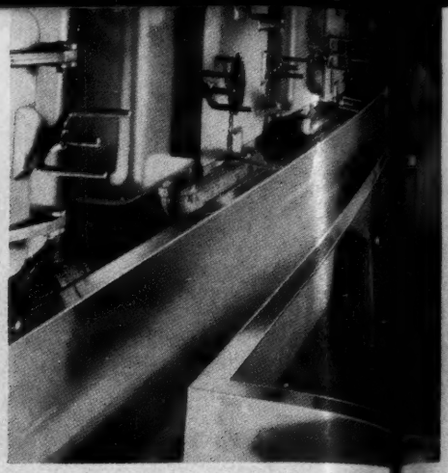
PNEUMATIC SCALE CORPORATION, LTD.

91 Newport Ave., Quincy, Mass. (Norfolk Downs Station)

Branch Offices in New York; Chicago; San Francisco; Los Angeles; Leeds, England; Paris; Melbourne; Sydney, N. S. W.; Wellington; and Buenos Aires



Hoppers and pans on these ice cream fillers and cappers *come in contact with the product.* So to forestall any possible trouble, hoppers and pans were made from ENDURO . . . the lustrous, easy-to-clean stainless steel that never imparts any foreign taste or flavor to the product.



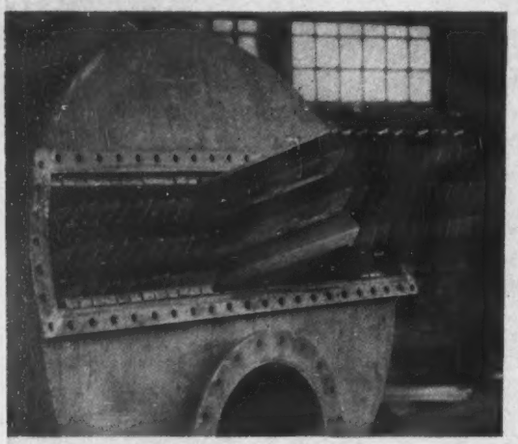
Here's another instance where the economy of ENDURO cookers and troughs becomes more apparent every day. With reduced cleaning time, and complete freedom from corrosion and other factors which pile up maintenance costs, the savings keep mounting the longer this equipment remains in service.

MODERN METALS

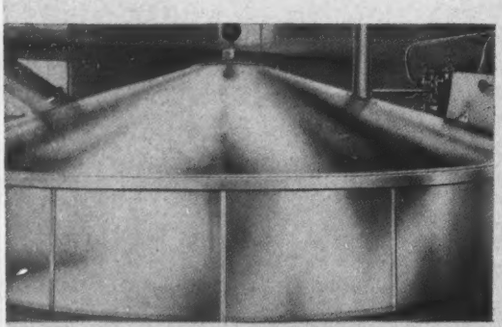
that keep quality standards high . . . equipment maintenance low

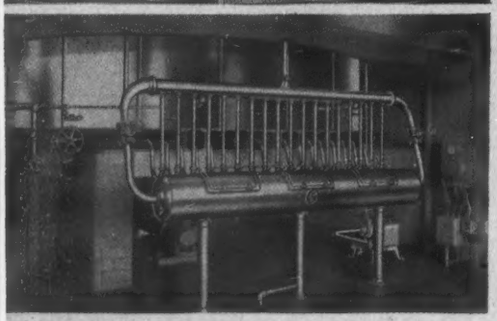
HERE's more evidence from food plants that reflects the swing toward modern, sanitary equipment metals that boost sanitation standards *and lower costs!* Universally preferred for food handling equipment . . . *well out in the lead* . . . we find ENDURO*, Republic's Perfected Stainless Steel. Corrosion-resisting throughout, silvery in appearance, tough, smooth, easy-to-clean, and well able to take steady service indefinitely! Likewise TONCAN* IRON . . . Republic's iron-copper molybdenum sheet metal . . . widely specified wherever corrosive conditions mean early failure of ordinary sheet metals. And Republic does not stop there. It supplies the food industry with Tin Plate, Resistance Welded Pipe and Tubing of ENDURO, Shipping Containers, TONCAN IRON Enameling Sheets, ENDURO bolts and nuts, etc. Food plants have learned it pays well to be equipment conscious, yet budget-wise with Republic's modern metals. Why not get all the facts? Write Republic, Dept. FI, at Cleveland today... Republic Steel Corporation, General Offices: Cleveland, Ohio; Alloy Steel Division, Massillon, Ohio.

*Reg. U. S. Pat. Off.



Maximum rust-resistance is the prime requisite for the "catch-all" or baffle in this condensing unit. That's why TONCAN IRON was selected . . . to greatly lessen the rust hazard, and insure continuous, profitable operation of the equipment over a greater number of years.

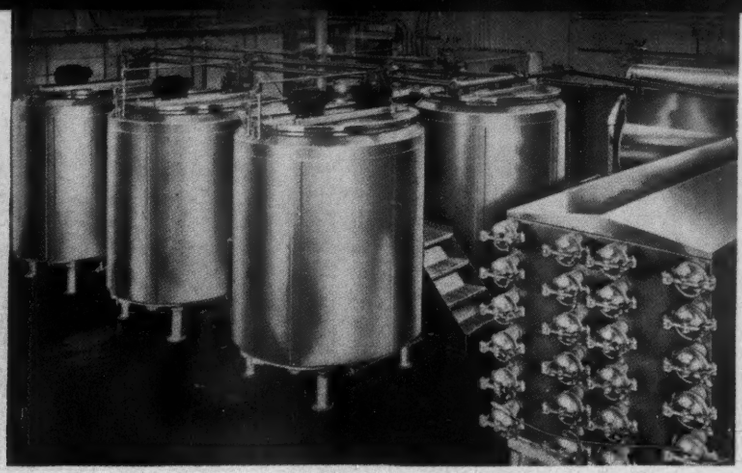




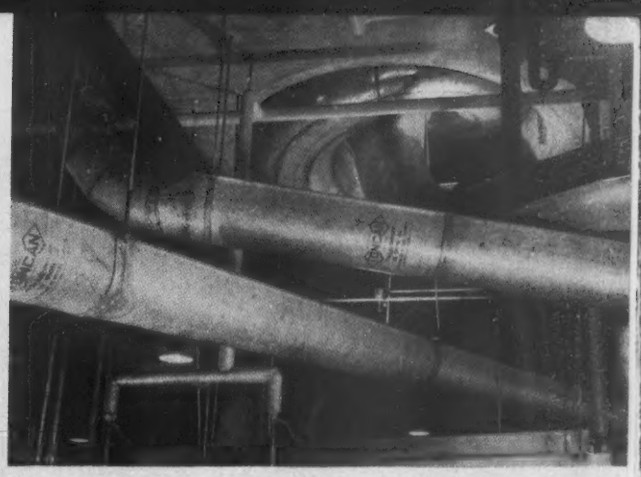
A gleaming, light-weight sheathing of ENDURO Stainless Steel converts this lauter machine into an impressive "show piece" for plant visitors. Wherever the "visitors welcome" sign is hung, remember the appeal and lasting impression of extreme cleanliness that ENDURO creates.

REPUBLIC STEEL

STEEL AND TUBES, INC.
TRUSCON STEEL COMPANY
UNION DRAWN STEEL DIVISION
NILES STEEL PRODUCTS DIVISION
BERGER MANUFACTURING DIVISION

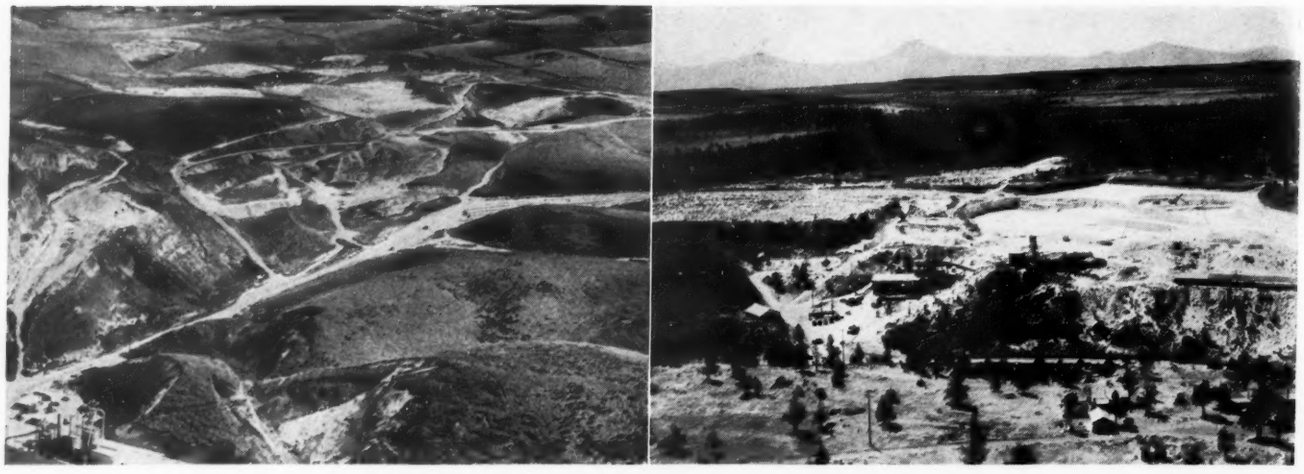


"From every angle, ENDURO is the most efficient, most economical metal for dairy equipment," says the superintendent of this milk plant. "It never even discolors, and we always can be sure that it is thoroughly clean, and that the milk will be safe from contamination."

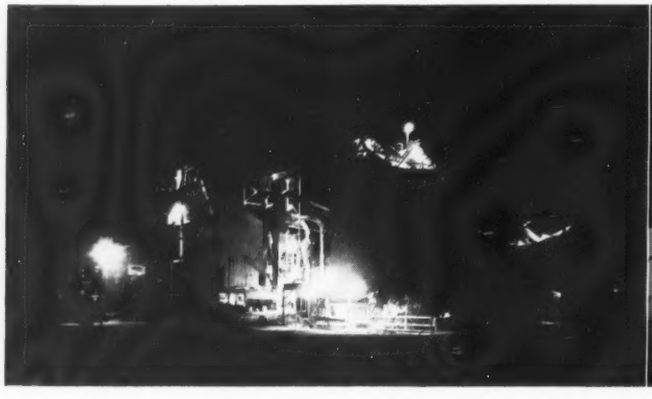


In this plant TONCAN IRON is used to forestall maintenance and provide long, low-cost life to paunch chutes. Only Republic makes TONCAN IRON . . . and only TONCAN IRON offers such low-cost rust protection.

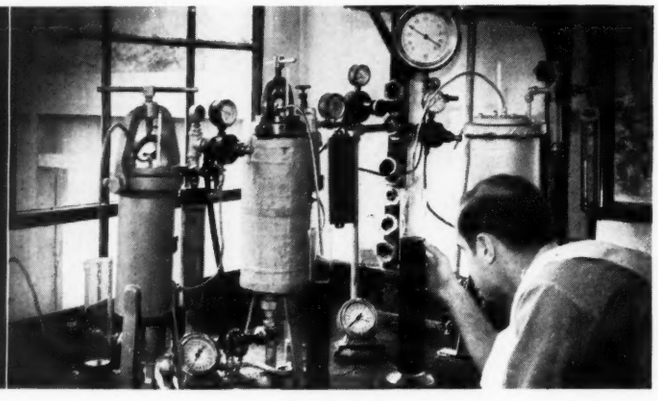
Cleaning large food hoppers can be a long, burdensome job, or a quick, easy one . . . depending on the metal. These hoppers are the easy-to-clean kind . . . requiring only a quick, simple washing . . . because they are made from sanitary, stain-resisting ENDURO Stainless Steel.



2 VAST SOURCES of DICALITE FILTERAIDS assure continuous supply to meet all filtration requirements.



2 Plants equipped to supply all filtration requirements and provide ample stocks for prompt deliveries.



2 Laboratories, located at the plants, to provide constant technical control assuring uniform high quality.

Why has the DEMAND for DICALITE FILTERAIDS INCREASED in the Food Industries year after year?

Because they are DEPENDABLE

. . . **in QUALITY**—DICALITE FILTERAIDS give the desired clarity, or better, at HIGHER flowrates—therefore, *lower* cost per unit of finished product.

. . . **in UNIFORMITY**—Precise production methods under constant technical control assure uniform high quality of every bag of DICALITE FILTERAIDS.

. . . **in AVAILABILITY**—With two vast sources of supply, The Dicalite Company can supply your requirements promptly for several hundred years to come.

Why not try DICALITE in your operations? Write to Dept. F1.

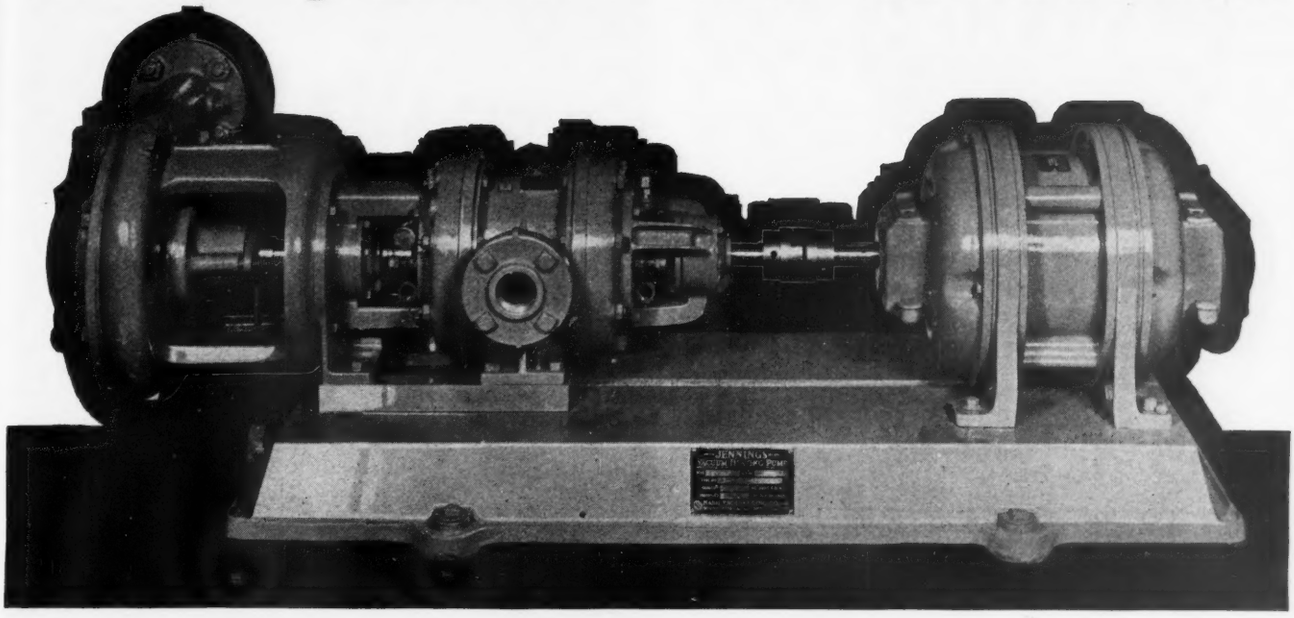
FILTERAIDS INSULATION ADMIXTURE ABSORBENTS FILLERS

THE DICALITE COMPANY

520 N. Michigan Ave. CHICAGO
120 Wall Street NEW YORK
756 S. Broadway LOS ANGELES

A SUPERIOR QUALITY FILTERAID FOR EVERY FILTRATION NEED

Nash—the Perfected Vacuum Pump for Evaporators and Condensers

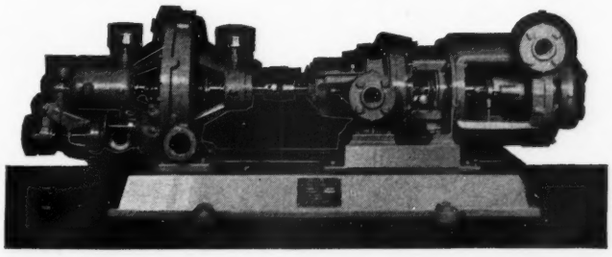


COMBINATION VACUUM REMOVAL UNIT ESPECIALLY DESIGNED FOR SATISFACTORY OPERATION ON CONDENSERS WITHOUT BAROMETRIC LEG

Especially designed for drawing air and liquid from high vacuums, the Nash Vacuum Removal Unit is an efficient combination of a standard Nash Vacuum Pump and a Jennings Centrifugal. This design may be had in either motor or steam turbine drive, and may be installed with confidence that it will operate perfectly.

Nash Vacuum Pumps for Evaporator and Condenser Service offer unusual advantages. Vacuum is non-pulsating, producing uniform operating conditions and assuring a better product. Nash Vacuum Pumps have no valves, gears, pistons, rings, or mechanical complications. The single moving element rotates without metallic contact, and no internal lubrication is required. In standard design these pumps maintain vacuums up to 27" of mercury.

Nash Pumps are compact, and require but a fraction of the space taken by old type equipment. They may be installed where convenient, and they operate at suitable speeds for direct connection to either electric motors or steam turbines. Nash engineers will be glad to recommend proper equipment to exactly meet your particular requirements.



THE NASH VACUUM REMOVAL UNIT MAY BE HAD EQUIPPED WITH STEAM TURBINE DRIVE WHERE THIS TYPE IS PREFERRED

NASH ENGINEERING COMPANY

SOUTH NORWALK · CONNECTICUT, U. S. A.

CAUTION!

PACKAGING COSTS ARE VITAL TO QUICK-FREEZING!

Ordinary packaging methods don't hold in the quick-freezing field. Many new conditions appear: Humidity and temperature factors, new storage and shipping complications. Now that the field has been opened, competitive pricing becomes important. Economies must be found to bring prices in line. Experience shows that a quick-freezing venture may succeed or fail on packaging costs alone!

For a number of years, Container Corporation of America research men have been studying packaging for this field. Our staff has compiled the *facts* on the case—the possibilities *and* the limitations . . . information of vital importance to any organization interested in quick-freezing.

The coupon below—or a call to a Container Corporation of America office—will bring one of our staff to your office. Arrange for a discussion today.

CONTAINER CORPORATION OF AMERICA

General Offices: 111 West Washington Street, Chicago, Ill. Mills, Factories and Sales Offices at Strategic Locations

11-12

CONTAINER CORPORATION OF AMERICA
111 W. Washington St., Chicago, Ill.

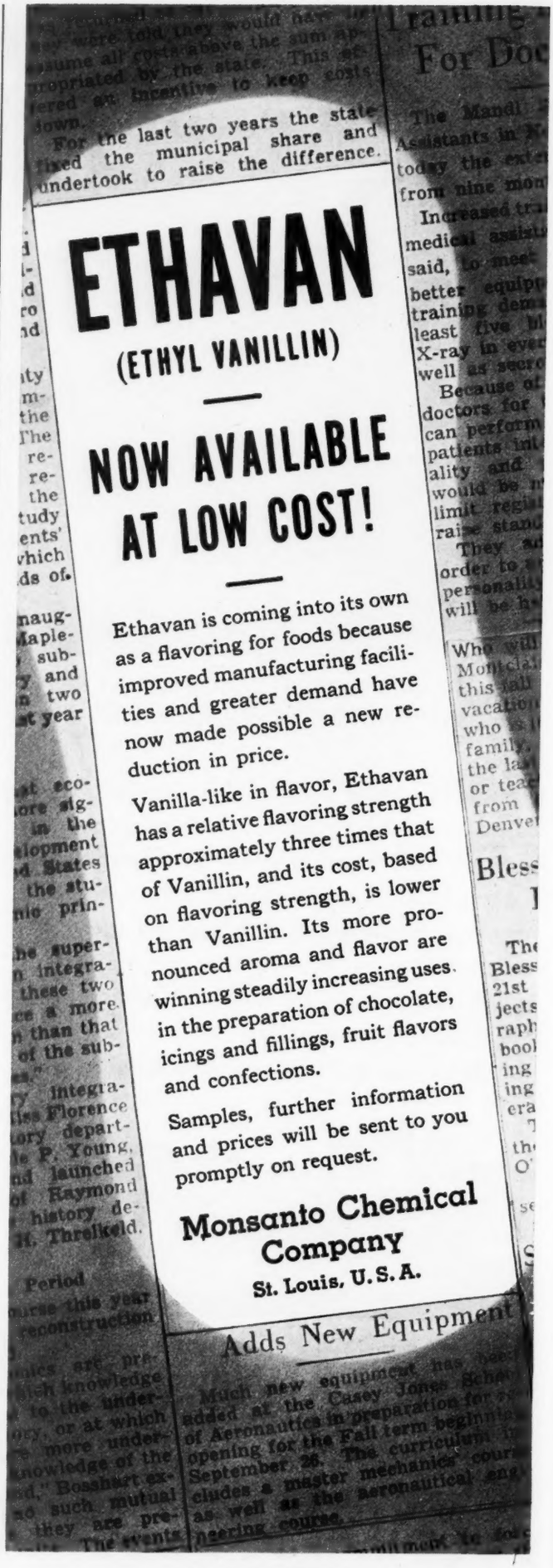
Gentlemen: I am interested in your findings on packaging in the quick-frozen food field. Will you have one of your staff call on me?

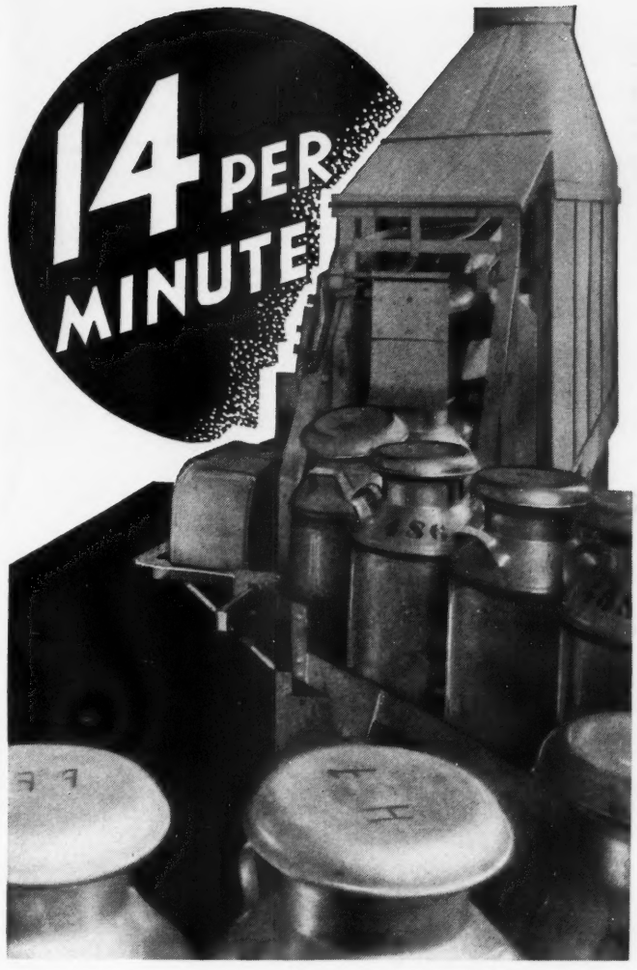
*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____


For the last two years the state
undertook to raise the difference.
ETHAVAN
(ETHYL VANILLIN)
NOW AVAILABLE AT LOW COST!
Ethavan is coming into its own as a flavoring for foods because improved manufacturing facilities and greater demand have now made possible a new reduction in price.
Vanilla-like in flavor, Ethavan has a relative flavoring strength approximately three times that of Vanillin, and its cost, based on flavoring strength, is lower than Vanillin. Its more pronounced aroma and flavor are winning steadily increasing uses in the preparation of chocolate, icings and fillings, fruit flavors and confections.
Samples, further information and prices will be sent to you promptly on request.
Monsanto Chemical Company
St. Louis, U.S.A.
Adds New Equipment



Sterile-Clean-Bright

DO YOU clean metal containers of any kind? Then know the thoroughness and greater safety of Metso Cleaners.

Plants washing cream and milk cans at 14 per minute are particularly pleased with the twin-action of Metso. It removes all grease and dirt, yet preserves the shine and luster of tin, aluminum and other sensitive surfaces. One plant using aluminum alloy for cream cans reports them still in good condition after washing with Metso for three years.

The balanced chemical proportions of alkali and silica in Metso* insure this safety margin with rapid, complete cleaning. Compare Metso with your present cleaner. Further information on request.

*Sodium Metasilicate U. S. Pat. 1898707

PHILADELPHIA QUARTZ CO.

General Offices and Laboratory: 125 S. Third St., Phila., Pa. Chicago Sales Office: 205 W. Wacker Drive. Distributors in over 60 cities.

Only P.Q. makes

METSO CLEANERS

Exact Weight Scales

the Processing Industry's most Versatile Scale . . .

Model 273
Capacity—12 lbs.

ARE your present scales interchangeable throughout the plant? For most operations they should be.

The new Model 273, with scoop and counter balance, was expressly designed and built for food processing plants with these outstanding features:

(1) Delivers absolute uniformity of product in the ingredient compounding operation.

(2) Fully corrosion treated for sloppy conditions which insures trouble-free operation.

(3) Remove the scoop and you have a high speed packaging scale that fits any production line.

(4) Portable, no leveling necessary, weighs accurately to ⅛ oz. on out-of-level work tables.

Does your present weighing equipment measure up to these standards?

Write for our Food Processors Catalog then let us demonstrate and prove these claims in your plant.

THE EXACT WEIGHT SCALE CO.
21 W. Fifth Ave. Columbus, Ohio

THERE IS NO SUBSTITUTE FOR EXACT WEIGHT

INDUSTRIAL PRECISION SCALES

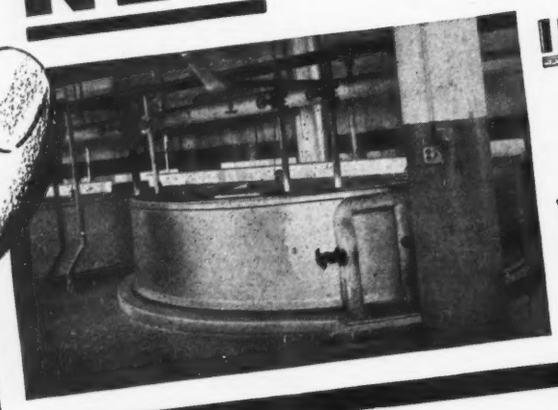
You'll SAVE either way!

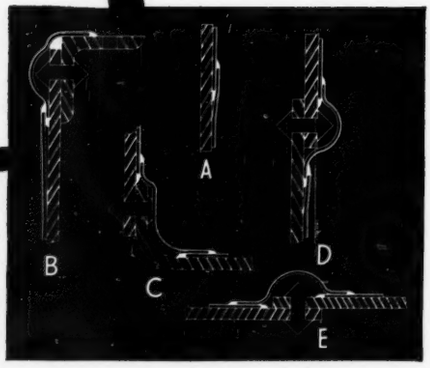
Re-line OLD TANKS with INGACLAD (Trade Mark Reg.) STAINLESS-CLAD STEEL

"A Borg-Warner Product"

Line NEW TANKS with INGACLAD (Trade Mark Reg.) STAINLESS-CLAD STEEL

"A Borg-Warner Product"





DETAIL A—Lap-weld construction for side wall and bottom of tank.

DETAIL B—Method of forming IngAclad over top reinforcing angle and top course of rivets.

DETAIL C—Forming IngAclad around corners.

DETAIL D—Illustrates formed section of IngAclad covering rivets on side walls.

DETAIL E—Shows formed section of IngAclad covering rivets on bottom of tank.

NOTE:—*Simple inexpensive lap-welding is used throughout. No "fit-up" troubles.*

Prominent Users of IngAclad Include:

American Maize Products Co.
Armour & Co.
Campbell Soup Co.
Carnation Milk Co.
Corn Products Refining Co.
Fleischmann Co.
General Foods Corp.
Kraft-Phenix Cheese Co.
Libby, McNeill & Libby
Morton Salt Co.
Postum Cereal Co.
Quaker Oats Co. (Canada)
Standard Brands Inc.
Swift & Co.

Write for IngAclad Folder and special information on procedure for lining Tanks with IngAclad Stainless-Clad Steel

If you have a corrosion problem in your plant or in the storing or transporting of raw materials or finished products, by all means, get the facts about IngAclad.

Here is a steel combining in one, the corrosion-resisting qualities of solid stainless on one side, and the economies, welding and fabricating qualities of mild steel on the other.

In many places where you have felt the cost of stainless protection would be prohibitive, you now find it possible to use IngAclad within your budget. The basic material cost of IngAclad is only about half that of the solid stainless metal.

If you have old tanks that need re-conditioning, you may now convert them into modern stainless equipment, at low cost, by re-lining them with IngAclad. And, naturally, if you are figuring on newly fabricated large tanks that must give stainless service, you will want to consider the great economies that lining with IngAclad makes possible.

INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
Specialists in High Carbon, Alloy and High Speed Steel and Stainless-Clad Sheets and Plates
310 South Michigan Avenue, Chicago, Illinois
Plants: Chicago, Ill.; New Castle, Ind.; Kalamazoo, Mich.

STAINLESS PROTECTION AT LOWER COST

Sales Representatives in Principal Cities

Automatically MAINTAINING LOW DELIVERY PRESSURES WITHIN CLOSE LIMITS

CASH STANDARD *Type 34*

PRESSURE REDUCING VALVE

This is a direct operating, direct acting, pressure reducing valve that receives the *variable,* high inlet pressure—automatically reduces it to a lower delivery pressure—and dependably maintains the reduced pressure . . . It is applicable to pressure control of Steam, Hot or Cold Water, Air, Oil, Brine and most liquids and gases.

No Lost Motion . . . No Loose Joints . . . The inner valve is directly actuated by the diaphragm, which is particularly sensitive, due to its large area. There is no appreciable wear on the diaphragm stem or packing, because perfect stem alignment is always assured by a set of two Nitralloy 3-roller guides, which kill side strains on the valve stem.

Made in twelve sizes—equipped with Air Cooled, or Water Cooled Packing Boxes—for high temperature use.

Investigate the production economies assured by the design and construction of Cash Standard Type 34 Pressure Reducing Valves.

CASH STANDARD Type 34 PRESSURE REDUCING VALVE

A. W. CASH COMPANY

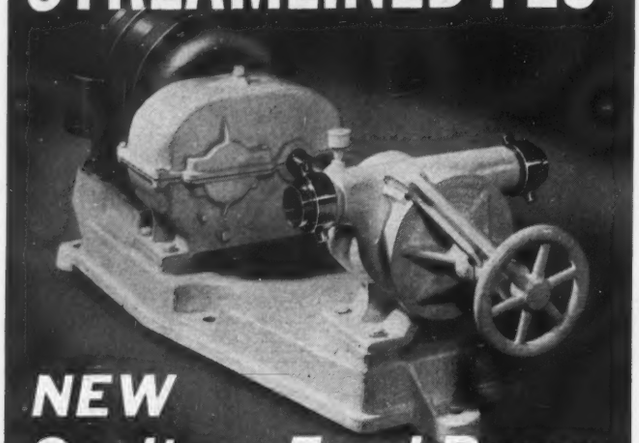
DECATUR • • ILLINOIS

CASH STANDARD CONTROLS . . VALVES

VALUABLE TABLES and CAPACITY CHARTS

FREE—Valuable, quick reading, accurate tables and capacities for Steam, Air, Gas, Water and other liquids are contained in Bulletin No. 34 . . . Send for your copy today.

STREAMLINED FLO



NEW Sanitary Food Pump

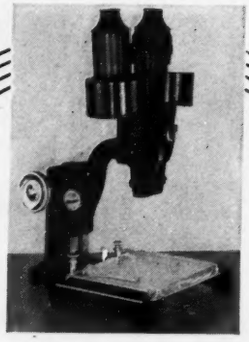
New design that gives perfect streamlined flow!—pump interior devoid of ALL "dead spots" where food might collect and spoil. Famous BLACKMER "Bucket" type . . . will not "churn" or emulsify product handled. All parts easily accessible for sterilization—without disturbing pipe connections. Years ahead of older designs. Write for Bulletin UB370. BLACKMER PUMP COMPANY, 1869 Century Ave., Grand Rapids, Michigan.

FOR HANDLING ANY FOOD PRODUCT THAT WILL FLOW THRU PIPES

BLACKMER ROTARY PUMPS

AUTOMATIC TAKE-UP FOR WEAR

EXCLUSIVE BUCKET DESIGN



You can solve many problems *with this* Spencer Binocular Microscope

The Binocular Microscope is solving laboratory and plant problems for countless industries.

The Spencer Binocular Microscope has become a favorite because of its wide field of view and great depth of focus. It produces a more vivid stereoscopic image because the objectives converge at a 16° angle — an exclusive Spencer feature. Eye pieces converge at the comfortable angle of 8°, eliminating eye-strain. A dust-tight revolving drum carries objectives of different magnifications.

Write Dept. L-48 for a descriptive catalog

Spencer Lens Company

BUFFALO, NEW YORK

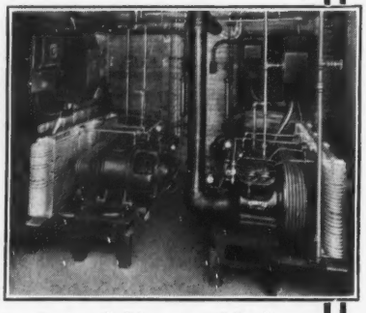
MICROSCOPES
MICROTOMES
PHOTO-MICROGRAPHIC EQUIPMENT

SPENCER BUFFALO

REFRACTOMETERS
COLORIMETERS
SPECTROMETERS
PROJECTORS

For Better Processing Conditions at Lowest Operating Cost

CURTIS REFRIGERATION AIR CONDITIONING and COMMERCIAL



CURTIS Condensing Units—the most important part of any air conditioning, refrigerating or freezing system—are delivering dependable, trouble-free service in food processing plants the world over. For Curtis equipment is quality built throughout. Curtis leadership is apparent in every detail of design and construction, reflecting eighty-five years of successful manufacturing experience; you'll find it in the high efficiency, silent, vibrationless operation and low-cost economical performance of every Curtis Unit. There's a Curtis model to exactly balance your refrigeration or air conditioning requirements. Specify Curtis—and be sure of satisfaction.

CURTIS REFRIGERATING MACHINE CO.

1992 Kienlen Avenue, St. Louis, U. S. A.

"Builders of Condensing Units Since 1922"

How to CUT HAND-PICKING in HALF...

What stock: Beans? Coffee? Nuts? Peas? What have you?

What job: Removing stones? Hulls? Chaff? Weevily stock? Or perhaps just grading?

No matter what separation you want, the SS & S Air-Float Separator will cut your hand-picking labor in half or less; make separations far finer than any human hand or eye can make; grade up stock to 100% perfect, or any lower grade you wish. Fully automatic during operation; just feed, and remove the separated stock. Simple, easily adjustable for different separation jobs; no skilled labor.

In a recent day's run in a Detroit plant, two SS & S Air-Float Separators worked 16,200 pounds of kidney beans, (9,000 lbs. badly fouled) without hand-picking, CLEAN. All stones, sticks, stems, pods and unhulled beans were removed; no loss of good stock whatever. In this plant, hand-picking has been reduced 50%, total labor in cleaning department 65%.

From a Wisconsin seed grower: "We hand-picked one lot of Alaskas at a cost of $3.25 per bushel; later ran same lot over your Air-Float Separator, which took out 25% of the already hand-picked seed. This 25% was examined very carefully, but no good seed was found. On making germination test, this 25% tested only 2%; the balance 94%."

From a Wisconsin canning company: "Removes all weevil-infested peas. These weevils burrow into the pea; almost impossible to separate clean any other way, even hand-picking. The machine **will pay for itself in this season's operations alone."**

Every canner knows how hand-picking on any badly fouled stock can put it quickly into the loss column. Yet 10% impure stock is separated through a SS & S Air-Float Separator just as fast as one 2% impure. The worse the stock, the bigger the saving. Owners buy low grade stocks and turn them to neat profits because first grade stock is so easily recovered from it.

This is not a fanning, blast or screening process. The separation is made during a process of air flotation; the material stratified according to relative density, or specific gravity. Good and weevily peas may be same size, same shape; but the lighter, weevily pea unfailingly reports off in the tailings, or waste.

Sutton, Steele & Steele, Inc., maintain the world's largest laboratory devoted exclusively to separations problems and backed by 50 years' experience; maintain field engineers in all principal industrial sections, fully qualified to analyze your separations problem. Write for interview, or send us a 100-lb. sample of your mixture. We will make the separation you require, free, return separated sample with complete laboratory report, then guarantee SS & S Air-Float Separator to do the same work in your plant. Send for Bulletin FI-812 for complete details.

SUTTON, STEELE & STEELE, INC.

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In Canada: KIPP KELLY, LTD., 68 Higgins Ave., Winnipeg

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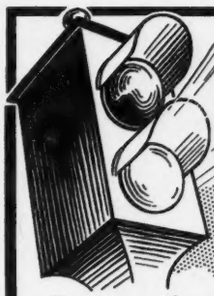
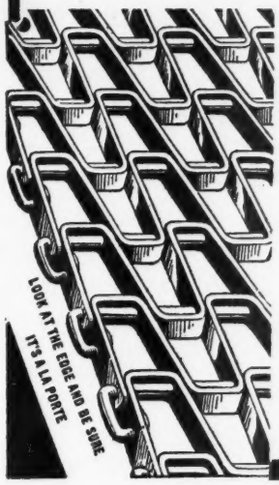


LA PORTE

FLEXIBLE STEEL CONVEYOR BELTING

TAKES THE "STOP AND GO" OUT OF FOOD PROCESSING

You can avoid costly delays and maintain peak production schedules with this revolutionary conveyor belting that meets every requirement efficiently and economically. LA PORTE Conveyor Belting will not creep, weave nor jump. It will not stretch—will not deteriorate when not in use and is easily cleaned with steam or by scalding with hot water. In addition, the open mesh feature permits the circulation of air around products in process and facilitates cleaning. Widely used for conveying fruit, vegetables, fish, meat and other products on grading, sorting, peeling and packing tables, also in scalders, washers, cookers, exhausters, elevators, etc. Its perfectly flat surface makes it ideal for conveying cans, bottles or containers empty or filled. Furnished in any length and practically any width.



Ask your Mill Supply House for LA PORTE Conveyor Belting TODAY or write to

La Porte Mat & Mfg. Co.
Box 124, La Porte, Indiana

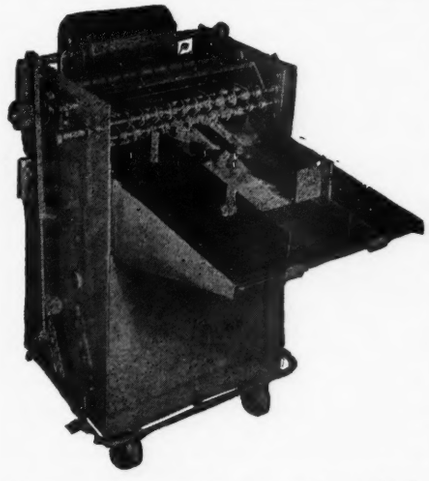
PROCTOR DRYERS

Manufacturers of well-known food products have long recognized the dependability of Proctor Dryers in maintaining high quality results while keeping drying costs at the lowest possible level. In addition, these manufacturers have found that drying machinery designed and built by Proctor & Schwartz assures greater hourly output, lessens steam consumption, maintains trouble-free operation, and considerably reduces floor space requirements.

PROCTOR & SCHWARTZ
INCORPORATED
PHILADELPHIA

See details regarding our products on page 73 of
FOOD INDUSTRIES
CATALOGS & DIRECTORY

FOR PLANTS
INTERESTED IN REDUCING
"CELLOPHANE" COST
• • • it's this PETERS SHEETER



If you are hand wrapping your products with "Cellophane," you will find this fully automatic PETERS "CELLOPHANE" SHEETING AND STACKING MACHINE will save you 10-25% of the cost of your material . . . just purchase your "Cellophane" in rolls and cut it yourself into desired size sheets ranging from 2" to 24" wide x 3" to 28" long. Easily and quickly changed from one size sheet to another.

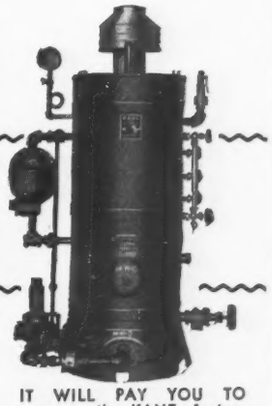
This machine is portable, requires floor space of only 3' x 4' and handles two rolls of material at the same time. If desired, a slitting attachment can be furnished . . . also predetermining counter.

Ask us to send you complete information on this inexpensive, fully automatic machine. We will be pleased to promptly send you full details.

PETERS MACHINERY COMPANY
4700 RAVENSWOOD AVENUE
CHICAGO . . . . . ILLINOIS
BRAMIGK & CO., LTD. . . . LONDON, ENGLAND

THIS boiler is built on the sound engineering principles we've learned and helped develop through a lifetime of building good boilers. It has

MORE FOR YOUR MONEY
in a **KANE**



all the features that have been proven to produce the lowest fuel cost in operation . . . the utmost convenience . . . the greatest savings in money and labor. **Yet it is surprisingly inexpensive.** You get extra value at no extra cost.

IT WILL PAY YOU TO compare the KANE, feature by feature, with any other boiler. You'll choose it. All details are given in our newest bulletin. Write for it; no obligation. Prove to yourself that the KANE gives you "more for your money".

MEARS-KANE-OFELDT, INC.
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Without obligation send me the new KANE bulletin.

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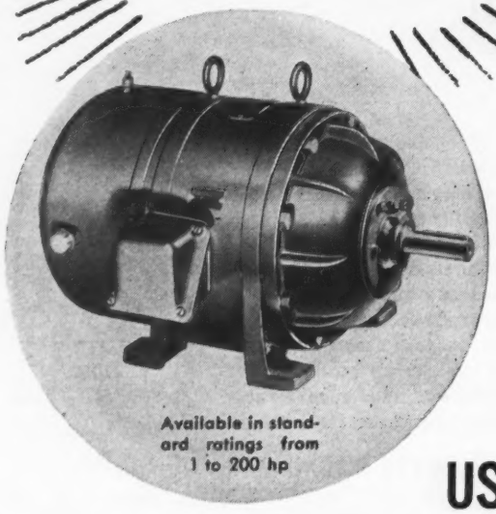
Against Flour- and Grain-Dust Hazards



Available in standard ratings from 1 to 200 hp

USE G-E
TOTALLY ENCLOSED MOTORS
FOR SAFE, DEPENDABLE OPERATION

THE General Electric totally enclosed, fan-cooled motor can be furnished with the label of the Underwriters' Laboratories indicating its suitability for Class II, Group G, hazardous dust locations. Its use, therefore, in locations that are exposed to quantities of flour and grain dust reduces fire and explosion hazards.

Dust-tight and weatherproof, this motor is also recommended for many other locations where special protection is needed. Because its smooth, tight-fitting enclosure keeps dust and moisture from the coils, insulation, and bearings, it gives continuity of operation with low maintenance expense.

For further information refer to the nearest G-E representative, or to General Electric Company, Schenectady, N. Y.

ELECTRIC EQUIPMENT FOR FOOD-INDUSTRIES PLANTS

General Electric also makes many other types of electric equipment. Included in the complete line are:

Gear-motors
Synchronous motors
Splashproof motors
Generator-voltage regulators
Motor-starting switches
Electric heating units
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GENERAL ELECTRIC

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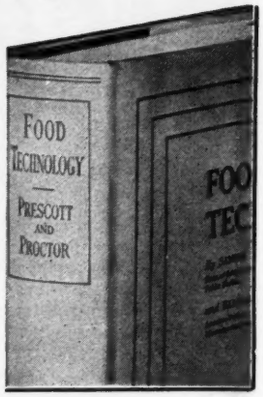
Your name stamped in gold on this book FREE



At no additional cost to you, we will stamp your name, or a friend's name in gold on the front cover of any copy of Prescott and Proctor's *Food Technology* ordered from this advertisement. This is a special Christmas offer, limited to acceptance before January 1, 1939.

Food Technology

By SAMUEL C. PRESCOTT

Dean of Science and Head of the Department of Biology and Public Health

and BERNARD F. PROCTOR

Associate Professcr of Food Technology and Industrial Biology
Massachusetts Institute of Technology

630 *pages*, 6 x 9, 70 *illustrations*, $5.00

"THE great food industries, taking advantage of scientific research and discovery, and operating under conditions of sanitary and economic control, are in reality great laboratories conducted with high standards of quality and efficiency of operation," say these authors. Their book describes these conditions, outlines these methods, for the guidance of all branches of the food industry.

Special features of the work are the emphasis on biological and technological chemistry and the sound treatment of such processes as refrigeration, canning, dairy products, quick freezing, etc. The book covers a range of material never before included in one compact volume.

Do you want to make a friend a gift combining personal thoughtfulness with real utility? Do you want a copy of this new book that you will doubly prize? Then take advantage of this free stamping offer. Send the coupon today. (Proper remittance should be enclosed with order and, of course, stamped copies are not returnable.)

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Send me Prescott and Proctor's Food Technology according to terms checked:

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☐ For 10 days' examination; without gold stamping. I will send $5.00 plus few cents postage in 10 days or return book postpaid. (Postage prepaid if cash accompanies order.)

Print name to be stamped, here

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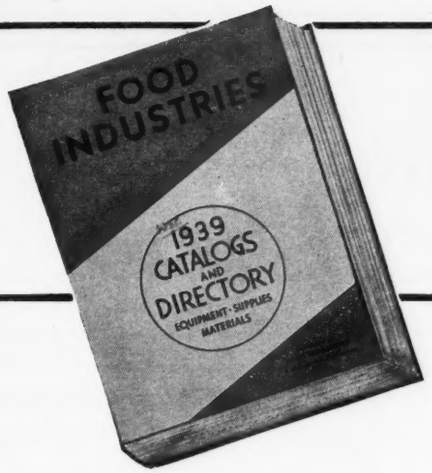
Position .....

Company .....Food 12-38



AN OPEN LETTER TO THE PRODUCTION EXECUTIVES OF THE FOOD FIELD

Gentlemen:

When the publication of FOOD INDUSTRIES CATALOGS & DIRECTORY was proposed last November, the announcement met with a response from the field which was at once most enthusiastic and gratifying. From every state in the Union and from many foreign lands top-notch production men wrote to us asking that a copy be reserved for them.

Naturally, the combined efforts of our editors were at once concentrated on the task of gathering the necessary material and preparing it for publication in May, as planned. Outside assistance was secured. Our office staff was augmented by the addition of two research workers, bringing the number of expertly trained people engaged in this undertaking to a total of six.

It soon became apparent, however, that our original plan of bringing out FOOD INDUSTRIES CATALOGS & DIRECTORY in the Spring was too ambitious. You will recall that one of the principal features of this new type Catalog is a REFERENCE SECTION dealing with Federal & State Food Laws and Regulations governing both manufacture and distribution. The task of securing copies of this material from Washington and the 48 states and then, for the first time, digesting and boiling it down into ONE VOLUME proved twice as big as we had anticipated. Publication simply had to be postponed, and we consequently wrote to each person who had requested a copy of the Catalog, advising him of the delay.

As this letter is being written, a copy of FOOD INDUSTRIES CATALOGS & DIRECTORY, now published, lies before us. The edition will be sent to you and some 12,800 other food production men before December 1st, and by the time you read this, you should have received your copy. We believe you will like it and, after examining the wealth of helpful material it contains, we hope you will agree that the delay was in a great measure justified.

M. C. Williams

Publisher

FOOD INDUSTRIES CATALOGS & DIRECTORY

WHERE TO STORE FROZEN FOODS

THE NATIONAL COLD STORAGE CO., INC.

Facilities for All Perishable
FROZEN FOOD STOCKS

New York City Area Distribution Made Convenient by Using our
Brooklyn and Jersey City Warehouses

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Walker 5-0743

QUAKER CITY COLD STORAGE CO.
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3 WAREHOUSES 3
Proper Temperatures For Frozen Foods

WESTERN REFRIGERATING CO.
GENERAL COLD STORAGE
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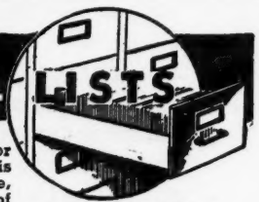

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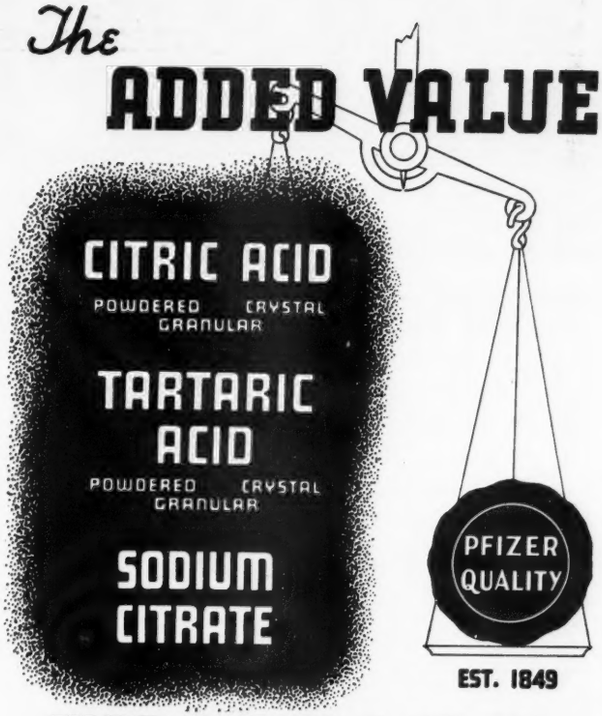

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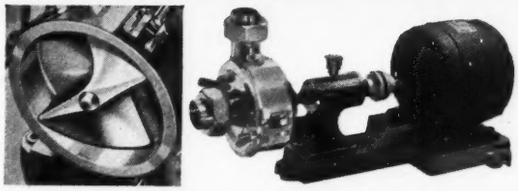

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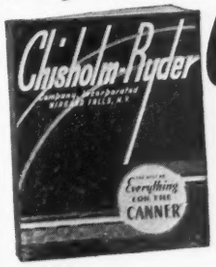

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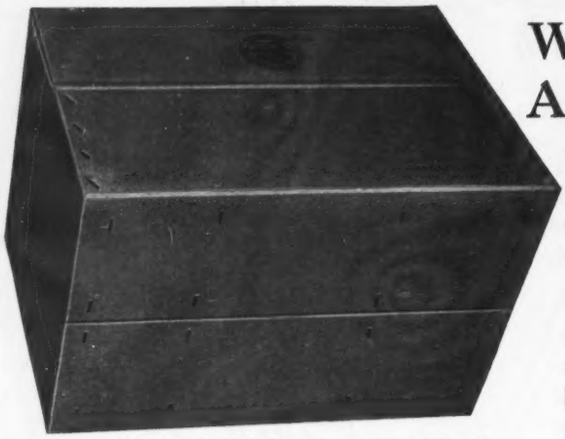

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New 1939 Dodge 1½-Ton, 160" W. B. Stake, 12-Foot Body.

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NEW Dodge trucks for 1939 give you distinguished new styling, new larger cabs, new rust-proofing, new features from one end to the other that will save you money on upkeep, make your truck last longer. Yet Dodge trucks are priced with the lowest! In "truck-built" Dodge trucks for 1939, Dodge gives you 5 vital advantages. Compare! Then see your Dodge dealer.

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2 AMOLA STEEL—This new super-tough steel is used for 1939 in vital Dodge truck parts.

3 STYLING—Distinguished, streamlined appearance for 1939 makes Dodge a moving advertisement to build prestige for your business.

4 ENGINE—Dodge 6-cylinder, L-head engine is simplest in design, has fewer parts, yet gives you many extra gas and oil saving features.

5 BRAKES—Dodge has genuine hydraulic type, fully equalized, stop quick, yet save tires and brake linings.

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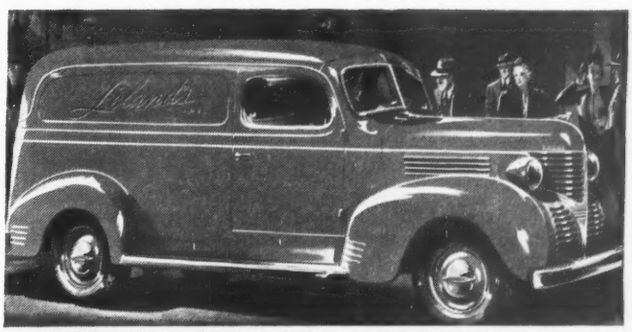
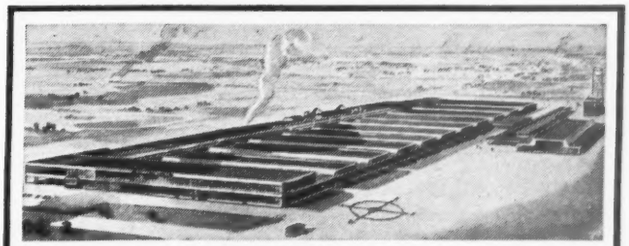


New 1939 Dodge ½-Ton Panel—116" Wheelbase, 6-cylinder, L-head engine. This truck strikes a new de luxe style note in the lowest price field. Yet it gives you many extra quality features to save you money.



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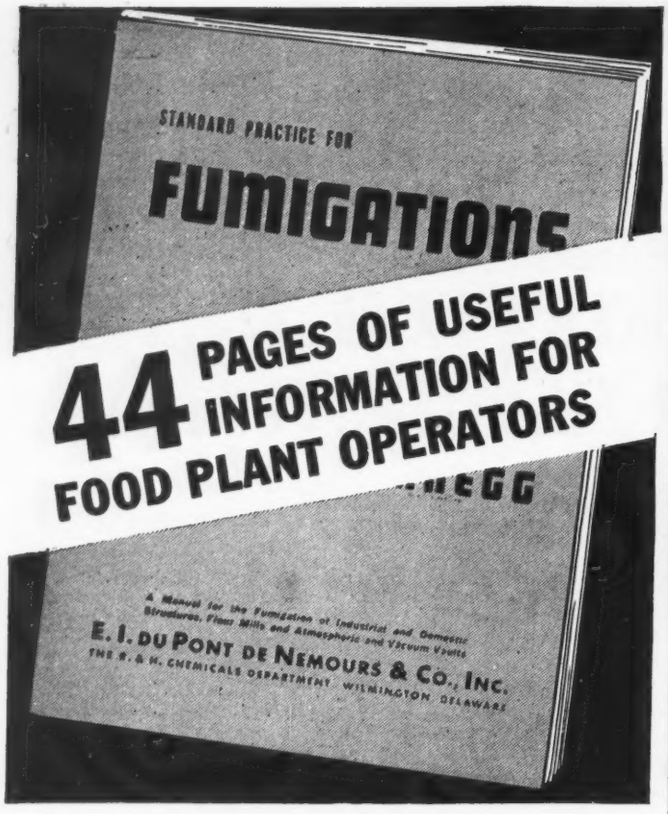
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44 PAGES OF USEFUL INFORMATION FOR FOOD PLANT OPERATORS
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DU PONT has prepared a new manual on cyanide fumigation, containing the kind of information which every food plant operator should have available. How to get the mill or plant ready for fumigation... how to carry out an HCN fumigation with gas generated from CYANEGG*... general dosage schedules showing amounts of fumigant necessary for control... how to identify unusual and common pests... first aid... precautions to be taken when fumigating... all of this and more is given in complete detail.

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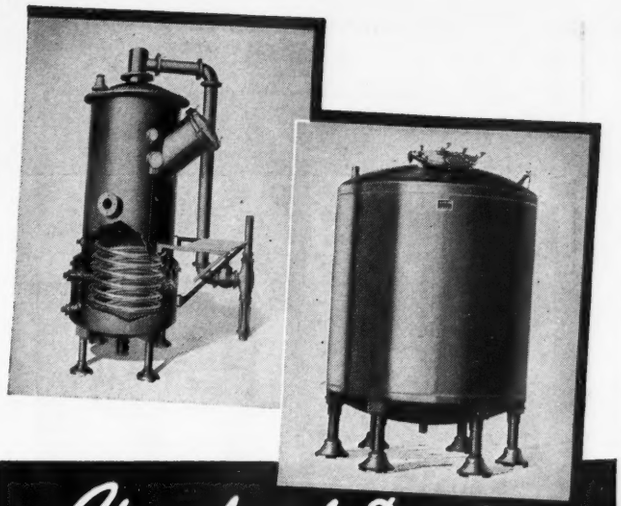

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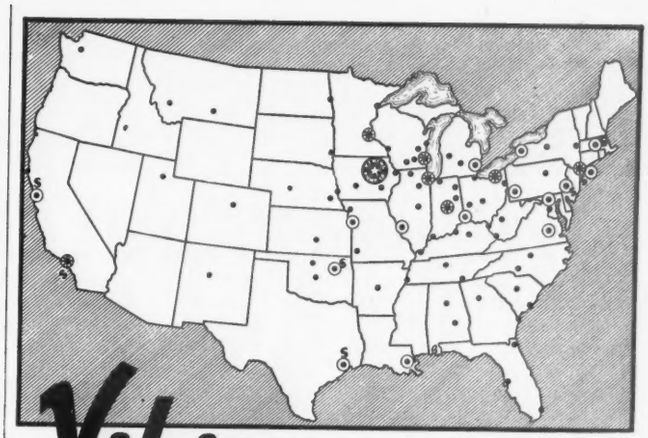

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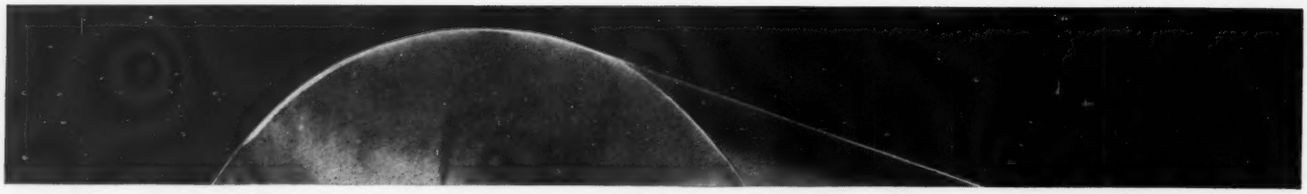

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STAINLESS STEEL

"PRECISION-BILT" ALLOY DESIGN

FOOD PROCESSING EQUIPMENT

When you buy stainless steel Food Processing equipment it's wise to order mechanically perfect equipment engineered by a company with a record for developing cost saving food equipment. Pfaudler not only builds stainless steel with the same exacting care as it does glass-lined steel, but also engineers it to your specific requirement.

Much cost saving food handling equipment in use today was developed by us . . . glass lined vacuum pans *guaranteed* to reduce a given quantity of material per hour, pressure—vacuum percolators which speed up extraction from days to a matter of a few hours, continuous automatic milk holding systems for handling as much as 40,000 lbs. of milk per hour, etc. These and other developments are a matter of record.

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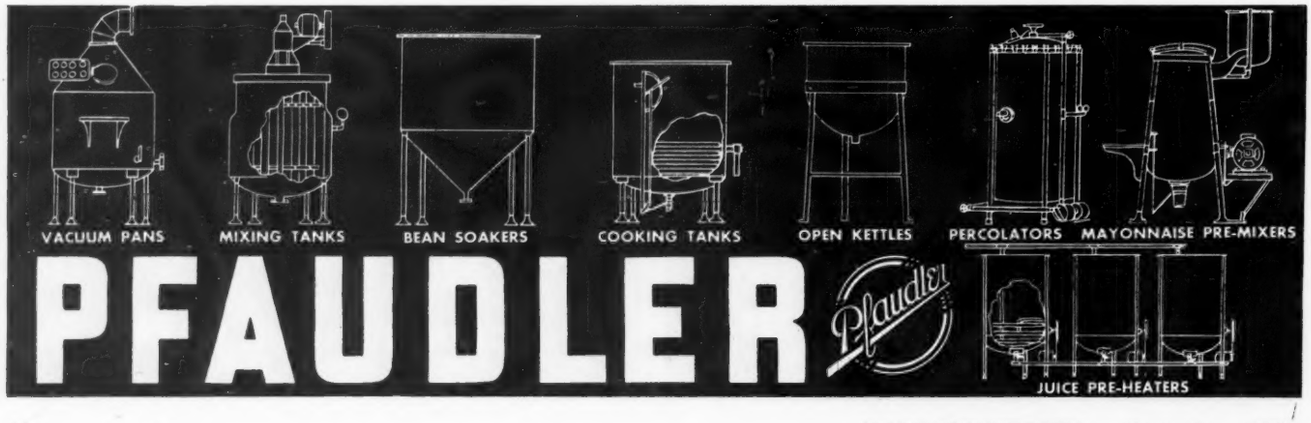
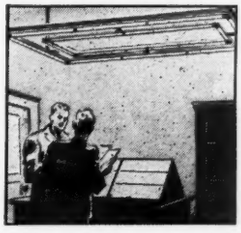


HERE'S NEW INDOOR DAYLIGHT FOR FOOD PLANTS

G-E FLUORESCENT MAZDA LAMPS GIVE SEVERAL TIMES MORE LIGHT . . . 50% COOLER



MORE LIGHT . . . COOLER—The new G-E Fluorescent MAZDA lamps give several times more light than incandescent lamps of the same wattage and color. For the same amount of light, they are 50% cooler. This is important to food plants where adequate lighting has been neglected in the past because the heat accompanying incandescent lighting has had a harmful effect on perishable products, as well as burdening the air conditioning plant.

NEW INDOOR DAYLIGHT—The daylight Fluorescent lamp provides the closest approach to real daylight ever produced at high efficiency. It affords new opportunities for lighting those departments and processes where color discrimination is important. With fluorescent lighting, it is possible to "daylight" entire departments economically instead of limiting the daylighting to small areas underneath color matching units.

G-E FLUORESCENT MAZDA LAMPS (also available in red gold, pink, blue, green and white) require special sockets and control equipment which are now available. Mail the coupon to the right or write today for your free copy of G-E's new illustrated booklet giving complete information about G-E Fluorescent MAZDA lamps. General Electric Company, Dept. 166-FI, Nela Park, Cleveland, Ohio.

GET YOUR **FREE** COPY OF THIS BOOKLET WITH COMPLETE DATA

GENERAL ELECTRIC

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Please send me, without obligation, your new booklet giving complete information about G-E Fluorescent MAZDA lamps.

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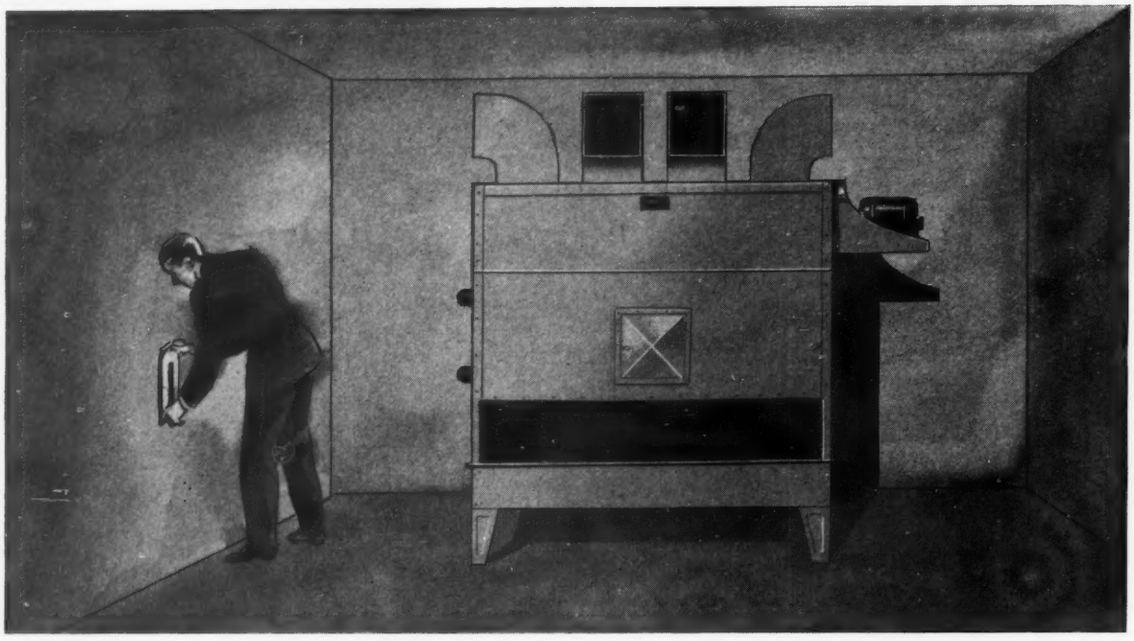
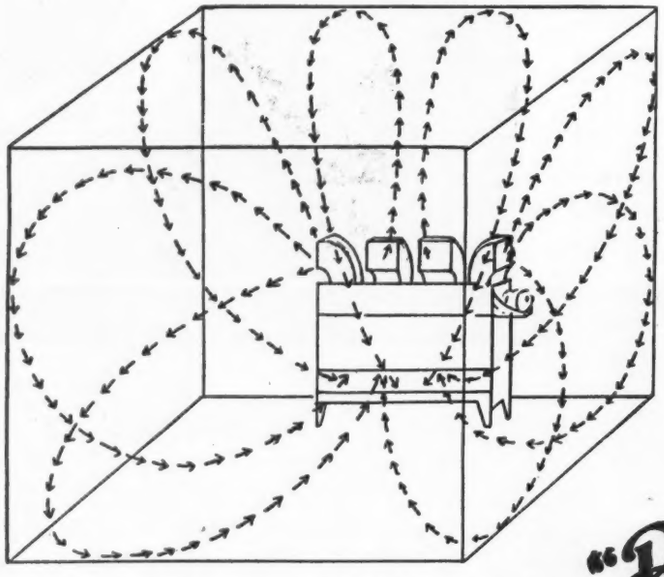
HOW SAFE ARE YOUR COLD STORAGE ROOMS?



This Thermometer Test will Tell You

●The purpose of the cold storage room is to *protect* your food products. Constant temperatures must be maintained throughout the entire cold storage area for that kind of protection.



This diagram shows why your food is safer when refrigerated with Buffalo Unit Cooler *live* refrigeration.

Freezing temperatures in one part and too high temperatures in another just won't do.

That's why so many cold storage rooms are being equipped with Buffalo Unit Coolers. All the air in the room is kept constantly in motion. All the air is cooled to the same degree. All the food is properly refrigerated.

If you are having difficulty in maintaining constant temperatures in your cold storage room, we suggest that you write us for complete information on Buffalo Unit Coolers. Please ask for Bulletin 3053.

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"Buffalo" UNIT COOLERS

IT ISN'T THE MEAT...IT'S THE HUMIDITY

. . . Rely on Taylor Control to prevent people saying wrong things about your food product

TODAY, leading meat packers know that both temperature *and* humidity are important factors in making a quality product for the American table.

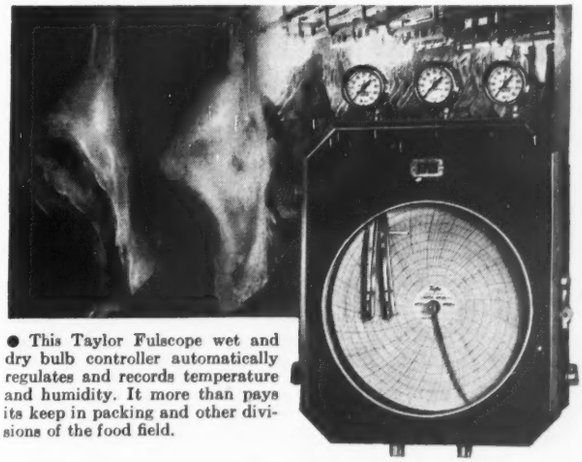
To regulate these two factors, so that meats can be cured and chilled under ideal conditions, the modern packer is relying on Taylor Control.

Meats in the curing room are kept within temperature limits which produce the best results. Then the smoked products are chilled and packed under closely regulated humidity to preserve the flavor, weight and general appearance.

When it comes to maintaining correct atmospheric conditions for production of any food product today, you don't have to guess or take chances. Taylor Controllers provide charts which tell you exactly what's happening. These charts can also be kept as a permanent record, for future reference and profit protection.

And once the ideal conditions are established, Taylor Controllers do the job of maintaining these conditions, year after year, accurately—and beyond the chance of human errors.

A Taylor representative will gladly tell you more about Taylor Control—how it can help to guard quality and profits—and pay for itself in more efficient processing. Taylor Instrument Companies, Rochester, N. Y. Plant in Toronto, Canada. Manufacturers in Great Britain—Short and Mason, Ltd., London, England.



● This Taylor Fulscope wet and dry bulb controller automatically regulates and records temperature and humidity. It more than pays its keep in packing and other divisions of the food field.

Taylor

Indicating Recording • Controlling

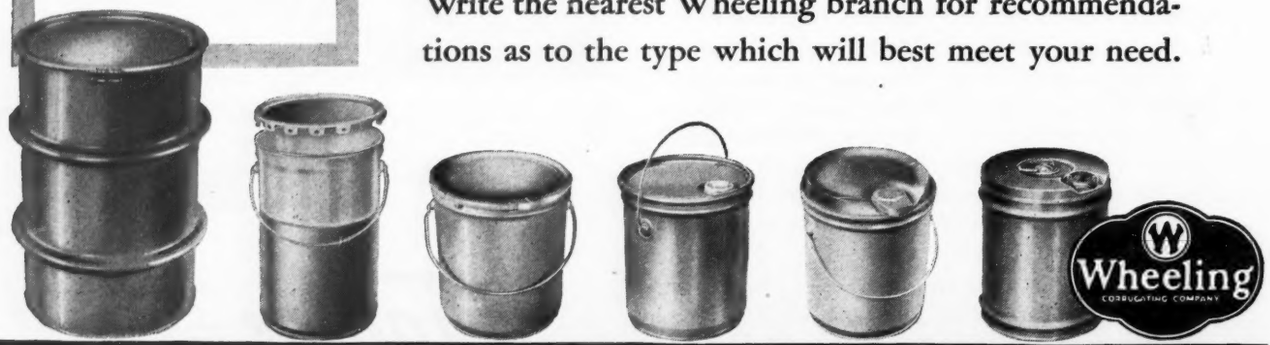
TEMPERATURE, PRESSURE, FLOW *and* LEVEL INSTRUMENTS

WHEELING STEEL DRUMS

Here are just a few of the types of Wheeling Steel Drums which are available in a wide range of capacities. Your choice of design and colors in lithography to make your "package" a productive advertisement for your brand.

Set the Record for Quality

Always first with new features that make for easier handling, more convenient use, or greater protection of contents, Wheeling Steel Drums are saving money for shippers of all kinds of products. There is a Wheeling Steel Container for every shipping requirement. Write the nearest Wheeling branch for recommendations as to the type which will best meet your need.



NEW YORK
CHICAGO
BUFFALO
KANSAS CITY
ST. LOUIS
PHILADELPHIA
BALTIMORE

WHEELING CORRUGATING COMPANY
STEEL CONTAINER DIVISION
WHEELING, WEST VIRGINIA

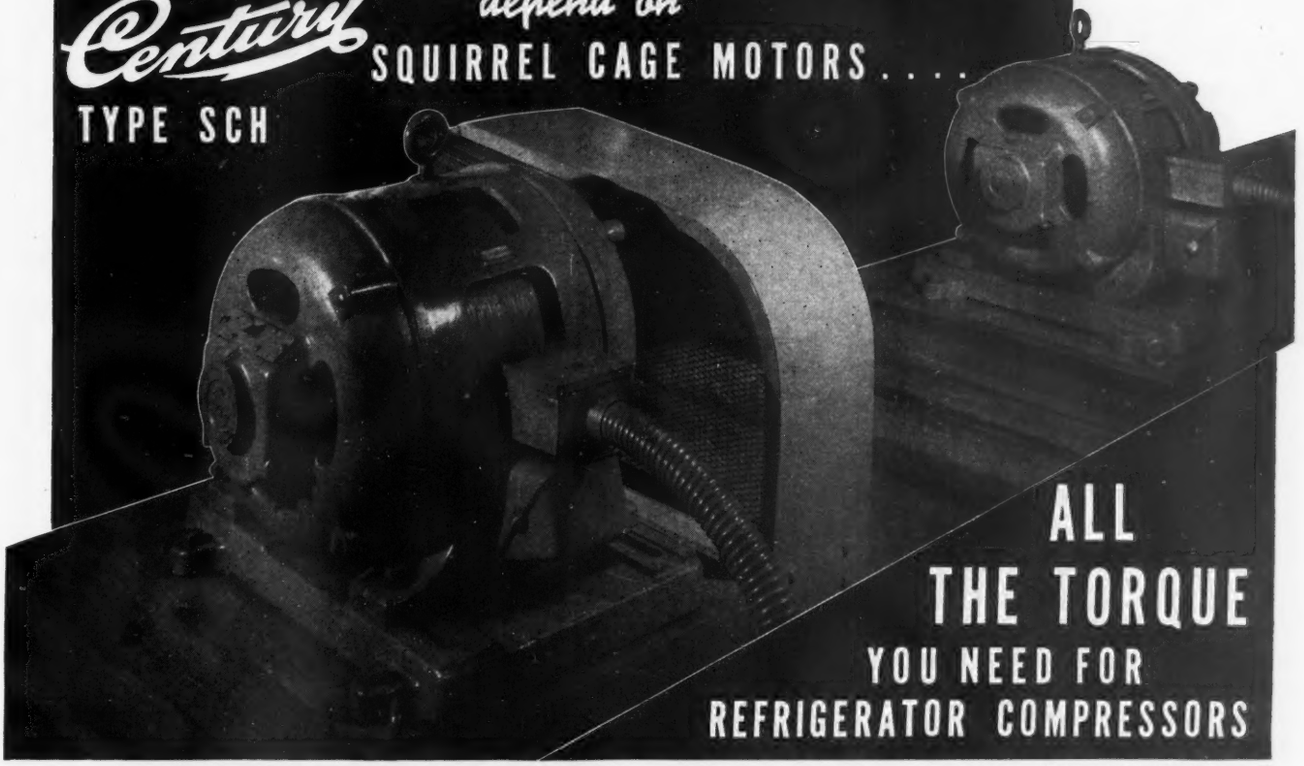
CINCINNATI
ATLANTA
BOSTON
MINNEAPOLIS
COLUMBUS
CLEVELAND
DETROIT

THOUSANDS OF USERS AND MANUFACTURERS

depend on

Century SQUIRREL CAGE MOTORS . . . .

TYPE SCH



ALL THE TORQUE YOU NEED FOR REFRIGERATOR COMPRESSORS

. . . . TO SAVE THE COST OF OVERMOTORING . . . .

TO INSURE ECONOMICAL PEAK PERFORMANCE

FROM REFRIGERATION COMPRESSORS . . . . . .

31 CENTURY BRANCHES

to serve you

Ask the Century Representative nearest you to show you why you don't have to pay for bigger motors than you need and how you can have unusually high starting and accelerating torques in proportion to the running torques.

Write for literature

Century Type SCH Motors are built with the Torque ability necessary to start the load (quietly) from rest, to accelerate it (quietly), and to operate it (quietly).

This dependable and ample starting and accelerating torque under the many conditions found in driving Refrigeration Compressors gives you a decided economy advantage such as in longer service life, minimized maintenance, and savings in motor cost.

Century MOTORS

CENTURY ELECTRIC COMPANY

1806 Pine Street • • • St. Louis, Mo.

Offices and Stock Points in Principal Cities

Atlanta • Baltimore • Boston • Buffalo • Chicago • Charlotte • Cincinnati • Cleveland • Dallas Denver • Davenport • Detroit • Houston • Indianapolis • Kalamazoo • Kansas City • Los Angeles • Milwaukee • Minneapolis • New Orleans • New York • Omaha • Philadelphia Pittsburgh • Rochester • Salt Lake City • San Francisco • Spokane • Seattle • Tulsa

ONE OF THE LARGEST EXCLUSIVE MOTOR MANUFACTURERS IN THE WORLD

SEARCHLIGHT SECTION

EMPLOYMENT : BUSINESS : OPPORTUNITIES : EQUIPMENT—USED or RESALE

UNDISPLAYED—RATE PER WORD:

10 cents a word, minimum charge $2.00.

Positions Wanted (full or part-time salaried employment only), ½ the above rates, minimum $1.00 an insertion, payable in advance.

Proposals, 40 cents a line an insertion.

INFORMATION:

Box Numbers in care of our New York, Chicago or San Francisco offices count 10 words additional in undisplayed ads. Replies forwarded without extra charge.

Discount of 10% if full payment is made in advance for four consecutive insertions of undisplayed ads (not including proposals).

DISPLAYED—RATE PER INCH:

1 inch $5.00
2 to 3 inches ..... 4.75 an inch
4 to 7 inches ..... 4.50 an inch
Other spaces and contract rates on request.
An advertising inch is measured vertically on one column, 3 columns—30 inches—to a page.
Food Industries

Copy for new advertisements must be received by December 23rd for the January issue

SPLENDID OPPORTUNITY

Leading manufacturer seeks experienced man capable of developing sales of complete line of bakery equipment. After factory training, a definite territory will be assigned. Travelling is essential. Drawing account and expenses paid. This offers excellent future to right man. Write in detail to

SW-370, Food Industries
330 West 42nd St., New York

POSITIONS WANTED

RECENT COLLEGE and University Graduate desires position in distribution, production, or sales department of reliable food concern. Salary secondary. PW-370, Food Industries, 330 W. 42nd St., New York, N. Y.

SALES: MANAGEMENT, PROMOTION. Experienced and efficient man, 35; extensive retail and wholesale merchandising background; for advertising agency; food processor or packer; equipment house. Now employed; available reasonably soon. PW-371, Food Industries, 330 W. 42nd St., New York, N. Y.

CHEMIST M.S., desires position as chemist in charge of laboratory or superintendent in milk or food plant. Extensive experience in production and chemistry of food and milk products. Knowledge of bacteriology and engineering. PW-372, Food Industries, 520 N. Michigan Ave., Chicago, Ill.

YOUNG FOOD CHEMIST. M.S. production and research experience with syrup, extracts, preserves, Maraschino cherries, etc. PW-373, Food Industries, 330 W. 42nd St., New York, N. Y.

!!! BIG SAVINGS !!!

USED EQUIPMENT

5 Copper Jacketed Kettles, 10 gals.
5 NEW Aluminum Urns or Kettles, 25 gals.
2 Jacketed Copper Kettles, 25 gals.

We are liquidating for a client a large stock of Pumps, Filter Presses, Storage Tanks, Air Compressors and general process equipment, which must be sold within the next 30 days. An opportunity for you to acquire REAL BARGAINS.

HIRSCH MACHINERY CO.
435 Frelinghuysen Ave. Newark, N. J.
Phone—BIgelow 3-5050

MACHINE TOOLS

Lathes, Shapers, Automatics, Drills, Planers, Milling Machinery, Boring Mills, Grinders, etc.

Large buyers of surplus machine tools and sellers of guaranteed rebuilt metal working machinery—Reliable, dependable.

SUN MACHINERY COMPANY
36 Van Vechten St., Newark, N. J.

Guaranteed Rebuilt Equipment

CHOICE ITEMS

1—Pneumatic Scale Auto. Screw Capper.
2—Pneumatic Packaging Units, including: carton feeders, top and bottom sealers, 2 stage weighers, wax liners.
6—Copper Vacuum Pans, jacketed, 40, 50, 75, 350 and 500 gal.
4—Kramer Screw Cappers, adjustable.
1—Arctic 4x4 Ammonia Compressor, complete.
6—Rotex Sifters 20"x48" Single Screen, m.d.
3—B. & S. Jack Digesters or Kettles, 10x3 ft.
2—World Rotary Automatic Labelers.

500 Ton Hydraulic Crackling Press.
5—Semi-auto. World, Ermold & National Labelers.
5—Cake and Mayonnaise Mixers.
Dry Powder Mixers, with and without sifters, laboratory size to 4000 lbs. capacity.
3—Karl Kiefer Rotary and Piston, Visco Fillers.
1—Independent 18 Filter Press, bronze plates.
8—Glass Lined Jacketed Kettles: 2—200 gal.; 2—250 gal. Agitated; 4—350 gals. jacketed.
2—Sprague Sells Retorts, 40"x72" complete.
1—Lewis Sugar Dryer, 32"x11' long.
1—#3 Schultz O'Neill Dustless Sugar Pulverizer.
5—Burt & Knapp Can Labelers.
3—Anderson Expellers #1, 15 HP motors.
Aluminum Steam Jack. Kettles, 10 to 175 gals.
Copper Steam Jacketed Kettles, 5 to 500 gals.
1—Albright-Nell Lard Cooling Roll 28"x48", complete with picker trough and pump.
3—Shriver 30" recessed Cast Iron Filter Presses.
MISCELLANEOUS — Glass Lined Tanks and Kettles, Copper Kettles, Filters, Filter Presses, Pony Mixers, Paste Mixers, Mills, Grinders, Pulverizers, Dryers, Pumps, Boilers. ... ...

Send for "CONSOLIDATED NEWS" listing complete stock.

We buy and sell from a Single Item to a Complete Plant

CONSOLIDATED PRODUCTS CO., Inc.

Office: 13-17 PARK ROW, N.Y. · Shops: 335 DOREMUS AVE., NEWARK

Buy With Confidence — "Consolidated"

For Sale at a Great Sacrifice

One brand new **Jones Cartoner**, and one **Redington Combination Cartoning** and **Cellophaning Machine** which cartons and wraps in one operation. Size of cartons—9/16 x 3-11/16 x 3-3/16.

O. E. SEGRIN
P. O. Box 505 Trenton, N. J.

FOR SALE

One **Burt Can Labeling Machine** #5091-A; One **Titan TA80 Cream Separator**; One **Union Dry Vacuum Pump** size 6⅛ in. x 14 in. x 6 in.

M & R Dietetic Laboratories, Inc.
585 Cleveland Ave., Columbus, Ohio

!"REACH the BUYERS"!

of used machinery and surplus new equipment

through the

SEARCHLIGHT SECTION of *Food Industries*

SELL for CASH the machinery you are replacing or that which is no longer needed in your plant.

For advertising rates and information address
Departmental Advertising Staff
Food Industries

Warehouse EVACUATION
REBUILT Equipment
forced out at 25¢ to 50¢
..... on the Dollar

FIRST MACHINERY CORP.
419 LAFAYETTE STREET NEW YORK, N. Y.
COMPLETE PLANTS BOUGHT AND SOLD
MFR'S & DEALERS NEW EQUIPMENT

GUARANTEED EQUIPMENT
Specialists in Equipping Complete Plants for
FOOD PRODUCTS
CHEMICALS
COSMETICS
LIQUORS
PLASTICS
PAINTS
SOAPS
INKS
ETC

TO MR. PLANT EXECUTIVE

October 26, 1938

Dear Sir:

Equipment for Chemical, Food, Drug, Paint or Process Industries to be sold at 20¢ to 50¢ on the dollar. We know that these prices are the lowest ever to be offered in our industry, but necessity knows no law.

On February 1st, we must absolutely vacate our gigantic warehouse on Corlears Street. The approach of New York's new East Side Drive at the time when our lease expires, plus the situation that even this great warehouse is insufficient for our growing needs, forces us to move.

Now you know, as a plant executive, the simply prohibitive cost of moving this bulky, tremendously heavy machinery and equipment. We're willing to shave that cost right off the price of every unit in our stock and give you and every other far-seeing production man, the benefit of this great removal expense.

You owe it to yourself and to your plant to check your machinery requirements very carefully, because if ever you bought equipment RIGHT, buy now and really make a BUY.

Very truly yours,
FIRST MACHINERY CORP.
Fred R. Firstenberg, Pres.

FRF/SS

Outstanding Offerings

At a Fraction of Original Cost

20th Century Pulper..$350.
Pfaudler 35 gal. Vacuum Pan with agitator $225.
6' Copper Vacuum Pan with condenser and Pump $1000.
Copper Percolator 42 x 36 .....$100.
Buffalo 42" Food Chopper, motorized .....$125.
Fowler Vacuum Filler, 6 spout .....$250.
Kiefer 18 spout Rotary Syphon Filler .....$200.
Burkhardt 36" Coating Pan with coils .....$200.
Sterling No. 16 Potato Peeler .....$65.

Send for our big CATALOG

FIRST MACHINERY CORPORATION

419 LAFAYETTE STREET
NEW YORK, N. Y.

F M C

LIQUIDATORS, APPRAISERS
Cable: EFFEMCY

MODERN GUARANTEED REBUILT MACHINERY

UNION Rebuilt Machinery

"SPECIALS"

1—Gayco 8 ft. Centrifugal Air **Sifter.**

2—Day 150 qt. Vertical **Mixers.**

1—W&P, size 16, class BB, 1500 lb. cap. **Mixer.**

3—Colton #3 **Tablet Machines.**

1—Stokes Rotary, style D, **Tablet Machine.**

1—Cartoning Machinery Co. Sample Carton **Forming and Filling Mach.**

2—Glascote 330 gal. cap. glass lined **Tanks** — jacketed — with motor driven agitators.

2—Ft. Wayne Rotary **Bottle Sterilizers.**

1—Standard 6 spout Automatic Vacuum type **Bottle Filler.**
World & National **Bottle Labelers.**
Dough type **Mixing Machines,** single and double arm, 1 to 10 bbl. capacity.
Copper Steam Jacketed **Kettles,** 10 to 200 gal. capacity with and without agitators, tilting & stationary.
Copper **Coating Pans,** with and without steam coils.
Refrigerating Machines, 1 to 50 ton capacities, also **Air Conditioning Equipment,** all types and sizes.

SEND FOR LATEST CATALOG

Write or Wire Collect for Prices and Information

UNION STANDARD EQUIPMENT CO.

320-322 LAFAYETTE ST., N. Y.

We Pay Cash for Single Machines or Entire Plants

FOR SALE

3—1500 gal. **Stainless Steel Truck Tanks.**
42" **Pfaudler Glass Lined Vacuum Pan.**
300 gal. **Pfaudler "Pre-Vak" Percolator.**
750 and 1000 gal. **Pfaudler Horizontal Tanks.**
100, 200, 300 and 500 gal. **Pfaudler Tanks,** jacketed and agitated.
12" **Sperry Stainless Steel Filter Press.**
12" and 18" **Schriver Filter Presses,** recessed.
18" **Shriver Iron Filter Press,** 12 chambers.
50 to 800 gal. **Homogenizers or Viscolizers.**
170 gal. **Copper Jacketed Kettle** 45"x33".
500 gal. **Copper Jacketed Kettle** 60"x60".
No. 3 and No. 5 **Stokes Water Stills.**
6x6 **Gardner Air Compressor,** 15 H.P. motor.
2 ft. to 7 ft. diameter **Copper Vacuum Pans.**
Large Stock of Refrigerating Machinery, also Milk and Ice Cream Plant Equipment.

Send Us Your Inquiries

ROBERT P. KEHOE MACHINERY COMPANY

1 East 42nd Street, New York, N. Y.

NEW AND USED

Steam Jacket, Copper Kettles

20 to 300 gal. capacity.

THOS. BURKHARD, INC.
494-496 Flushing Ave., Brooklyn, N. Y.
Coppersmiths Since 1836

AIR CONDITIONING UNIT

167 ton **Steam Jet Vacuum Cooling Unit** with pumps, motors, etc. Operated on exhaust, or live steam, or both.
750 KW **G.E. Auto Extraction TURBINE Unit,** 250#; 5 to 30# Bleeder Pressure. Surface Condenser switchboard.
323 HP **Springfield** Cross Drum **W. T. BOILER,** 250# A.S.M.E.

Power Plant Equipment Co., Inc.
39-41 Cortlandt Street, New York, New York

FOR SALE

2—6x36' **Louisville steam tube Dryers.**
3—#10 **Day Imperial Mixers.**
3—**M & S and Ayars Can Fillers.**
1—**Elgin 8-pocket Can Filler.**
50—**Copper Steam Jacketed Kettles,** 20 to 300 gal. with and without agitators, stationary and tilting.
3—**Filler Machine Co. Filling Machines.**
2—**Kiefer Visco Filling Machines.**
3—**U. S. and Kiefer Bottle Rinsers.**
5—**Bottle and Can Labeling Machines.**
10—**Hobart, Read, Triumph Mixers. Dough and Powder Mixers, Bottle and Can Fillers, Filters, Filter Presses, Mills, Dryers, Pumps, Boilers, Glass lined Tanks, etc.**

Send us your inquiries, also your list of surplus equipment, which we purchase for cash.

LOEB EQUIPMENT SUPPLY CO.
908 N. Marshfield Ave., Chicago, Ill.

FOR SALE

Read 80 quart **Mixer,** type X.H.D.
Hobart 80 Qt. **Beater,** Model M-180
Triangle Bag Filler, type SK
Schultz O'Neill Dustless Sugar Pulverizers, No. 0 and No. 2
350 gallon **Jacketed Glass Lined Tank**
150 gallon **Jacketed Glass Lined Tank** with motor driven agitator
50 gallon **Aluminum Jacketed Kettle**
10 gallon to 450 gallon **Copper Jacketed Kettles**
1 ton York, 3 ton **Frick Self Contained Ammonia Ice Machines**
5 ton **Baker,** 5 ton **Frick,** 3 ton **York Ammonia Compressors**

SAVAGE BROS. CO.

2632-46 Gladys Ave., Chicago, Ill.

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704B and 704C

see how food plants now keep quality standards high . . . equipment maintenance low . . . with modern metals.

★

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..Give you definite assurance of uniformity and high quality

An unusually wide and diversified range of steel products makes it possible to meet almost any requirement. Write for the Ryerson Stock List. Joseph T. Ryerson & Son, Inc. Plants at: Chicago, Milwaukee, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston, Philadelphia, Jersey City.

Immediate Shipment

A New Revised Edition of the

FROZEN FOODS DIRECTORY

will be published in the

JANUARY 1939 ISSUE

of

FOOD INDUSTRIES

ASSOCIATED REFRIGERATING ENGINEERS

SURVEYS • DESIGN • INSTALLATION

FINNEGAN TUBULAR FREEZERS

Multi-Stage and Spiral Types

Over Twenty Years of Experience in Adapting Refrigeration to the Preservation of Foods

2100 EAST VERNON AVENUE LOS ANGELES, CALIF.

You're Always "Face to Face" with Facts with *mono-therm* INDICATING THERMOMETERS

Instantly and easily readable, from a wide angle and from as much as 20 feet away, FOXBORO *mono-therm* Dial-Type Thermometers don't require "closeups" for accurate temperature measurement. Because they may be located as far as 200 feet from the bulb, it is never necessary to take readings in obstructed, awkward or poorly illuminated surroundings.

And you can always rely on *mono-therm* readings. They're *right!* Each instrument is individually certified for accuracy and response—not just at one midway check-point but over the entire length of scale. From bulb to calibrated spring the thermal measuring system is an integral unit. The inherent high accuracy is designed to withstand hard usage over long periods.

Years of FOXBORO experience make FOXBORO Instruments the logical "buy"—in accuracy, readability, speed and long-lasting ruggedness of construction. Don't accept a second-choice indicator . . . specify FOXBORO and be *sure!*

FOXBORO

REG. U. S. PAT. OFF.

THE FOXBORO COMPANY

30 Neponset Ave., Foxboro, Massachusetts, U.S.A.

Branch Offices in 25 Principal Cities

***mono-therm* INDICATING THERMOMETERS**

THE final test of consumer acceptance is the package. It must appeal to the buyer. Advertising of all kinds may create demand but the package must aid in clinching the sale. Heekin Lithographed Cans represent the best in the art of lithography. From the grinding of the basic colors to the final impression and the fabrication of the metal container . . . each process must be right. Heekin Lithographed Cans have character. THE HEEKIN CAN COMPANY — Cincinnati, Ohio.

HEEKIN *Lithographed Cans* WITH HARMONIZED COLORS

CARTAGE COMPANY CUTS GASOLINE COSTS 8% TO 10%

REDUCES ROADSIDE STOPS

"ANY TRUCK which shows a drop in miles per gallon is immediately checked up by your Automotive Engineer so that our fleet is always operating at high efficiency," writes Earl S. Barnett, of Barnett Detroit Cartage Company, in commenting on an 8 to 10% saving in gasoline mileage made for him.

"In addition to the above saving, our equipment has been remarkably free from mechanical trouble and resulting roadside stops, which we feel is largely due to the work done by your Engineer."

Let one of these Engineers explain to you just what he does. Have him demonstrate on one of your own units where economies can be made. This service is free to all fleet operators in the Middle West. Write 910 S. Michigan Ave., Chicago, Ill.

Copr. 1938, Standard Oil Co.

STANDARD OIL AUTOMOTIVE ENGINEERING

STANDARD OIL COMPANY (INDIANA)

AUTOMOTIVE ENGINEERING SERVICE

LOWERS MILEAGE COSTS